

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	EGO Dichtstoffwerke GmbH & Co. Betriebs KG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DBC-EGO-20240010-IBF1-EN
Issue date	06.03.2024
Valid to	30.08.2027

**EGOSILICON 100 ▪ EGOSILICON 110 ▪ EGOSILICON 111 ▪
EGOSILICON 120 ▪ EGOSILICON 151**
EGO Dichtstoffwerke GmbH & Co. Betr. KG



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EPD
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1. General Information

EGO Dichtstoffwerke GmbH & Co. Betr. KG

Programme holder

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

Declaration number

EPD-DBC-EGO-20240010-IBF1-EN

This declaration is based on the product category rules:

Building sealants, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

06.03.2024

Valid to

30.08.2027

Dipl.-Ing. Hans Peters
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(Managing Director Institut Bauen und Umwelt e.V.)

EGOSILICON 100 ▪ EGOSILICON 110 ▪ EGOSILICON 111 ▪ EGOSILICON 120 ▪ EGOSILICON 151

Owner of the declaration

EGO Dichtstoffwerke GmbH & Co. Betriebs KG
Kaltenbrunn 27
82467 Garmisch-Partenkirchen
Germany

Declared product / declared unit

1 kg EGOSILICON 100, 1 kg EGOSILICON 110, 1 kg EGOSILICON 111, 1 kg EGOSILICON 120 and 1 kg EGOSILICON 151

Scope:

This is a manufacturer--individualised EPD based on model declaration 'Silicone-based products, group 2' (EPD-DBC-20220180-IBF1-EN) from Deutsche Bauchemie e.V. (DBC), European Federation for Construction Chemicals (EFCC), Association of the European Adhesive and Sealant Industry (FEICA) and Industrieverband Klebstoffe e.V. (IVK) in which the product exhibiting the highest environmental impact in a particular group was selected from the group to calculate the LCA. This verified EPD entitles the holder to bear the symbol of the Institut Bauen und Umwelt e.V.. It exclusively applies to products produced in Europe and applies to a period of five years from the date of issue. This EPD may be used by members of DBC, EFCC, FEICA and IVK and their members provided. It has been proven that the respective product can be represented by this EPD.

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	
<input type="checkbox"/>	internally
<input checked="" type="checkbox"/>	externally

Matthias Schulz,
(Independent verifier)

2. Product

2.1 Product description/Product definition

EGOSILICONEs based on acetate (EGOSILICON 100, EGOSILICON 110, EGOSILICON 111, EGOSILICON 120, EGOSILICON 151) are manufactured from reactive siloxane, colour pigments, cross-linkers, bonding agents, catalysts and optionally by using fillers and so-called silicone oil. The products are formulated as moisture-reactive one-component systems. They permanently and elastically seal joints planned for the building. EGOSILICONEs fulfil key functions. Ingress of moisture into the structure via the joints is prevented by EGOSILICONS. With the use of EGOSILICONEs, the fitness for use of the building and the service life are decisively extended. The product displaying the highest environmental impacts was used as a representative product for calculating the Life Cycle Assessment results (worst-case approach). For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) products falling under the Regulation (EU) No 305/2011 (CPR) need a Declaration of Performance taking into consideration either the relevant harmonised European standard or the European Technical Assessment and the CE marking. For the application and use of the products the respective national provisions apply. EGOSILICONEs based on acetate (EGOSILICONE 100, EGOSILICON 110, EGOSILICON 111, EGOSILICON 120, EGOSILICON 151) fulfill the requirements of the application modules listed below and have the corresponding declaration of performance.

2.2 Application

Module 1: Façade sealants

Silicone-based products are used for the elastic sealing of joints. The areas of application for façade sealants include expansion joints (movement joints) and/or connection joints already existing in exterior walls and on window and door frames (including the inside section). All these sealants fulfil key functions of the building.

Module 2: Sealants for glazing

Silicone-based products are used for the elastic sealing of joints which may be subject to movement. Sealants for glazing are used in the following areas: (i) Glass to glass (ii) Glass to frame (iii) Glass to porous substrates

Module 3: Sanitary sealants

The areas of application for silicone-based sanitary sealants are joints in sanitary areas and kitchens. Joints sealed using sanitary sealants comprise connection joints between sanitary furnishings and the wall, connection joints between the floor and wall or movement joints across surfaces, for example.

2.3 Technical Data

The density of the products is between 1,00 and 1,30 g/cm³, other relevant technical data can be found in the manufacturer's technical documentation.

Module 1: Façade sealants

The minimum requirements on water and airtightness as per Table ZA.1 of EN 15651-1 apply: see table

Module 2: Sealants for glazing

The minimum requirements on water and airtightness as per Table ZA.1 of EN 15651- 2 apply: see table

Module 3: Sanitary sealants

The minimum requirements on water and airtightness as per Table ZA.1 of EN 15651-3 apply: see table

Constructional data

Name	Value	Unit
Density	1 - 1.3	kg/m ³
Elastic recovery EN ISO 7389	only for module 2: >90	%
Loss of volume EN ISO 10563	<10	%
Resistance to flow EN ISO 7390	≤ 1	mm
Tensile properties EN ISO 8339	only for module 1, 3 and 4:	
Adhesion/cohesion properties at maintained extension after immersion in water EN ISO 10590	only for module 1 and 4: NF*	
Adhesion/cohesion properties after exposure to heat, water and artificial light EN ISO 11431	only for module 2:Nf*	
Adhesion/cohesion properties at maintained extension after immersion in water for sealants in class XS and/or adhesion/cohesion properties after immersion in water for sealants in class S EN ISO 10590	only for module 3 and 4: NF*	
Allowable movement capability	> 20	%
Adhesion/cohesion properties at maintained extension after 28 days salt water immersion	only for module 4**:NF*	

* NF: Passed-Failed criteria.

The sealant class must also be indicated for the declared product.

** not required for interior use

valid for all modules: Other performance characteristics in accordance with the manufacturer's technical documentation/declaration of performance

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 15651:2012-12 Sealants for non-structural use in joints in buildings and pedestrian walkways.

Voluntary data: see technical data sheet and product certifications (not part of CE-marking).

2.4 Delivery status

Pasty in containers made of plastic, foil or metal. Typical container sizes contain 50 ml to 1000 ml of product. A combination of HDPE (high-density polyethylene) cartridges, cardboard and pallets were modelled for the LCA. For one and two components bonded glazing sealants (Module 5) 200 l metal drums and plastic or metal 20 l pails are used as containers.

2.5 Base materials/Ancillary materials

Silicone-based products, group 2 are manufactured from reactive siloxane and silanes, sometimes using fillers. The cross-linking reaction occurs through the effects of humidity in the air when installed. Typically, the products covered by this EPD contain the following range of base materials and auxiliaries (% by mass):



Siloxanes: 45-90
Silanes: 2-10
Silicone plasticizers: 0-30
Mineral fillers: 0-50
Fumed silica: 0-20
Mineral oil/Solvent: 0-30
Pigments: 0-20
Water: 0-20
Additives: <5
VOC according to Decopaint Directive: ≤2 % (mandatory)

These ranges are average values and the composition of products complying with the EPD can deviate from these concentration levels in individual cases. More detailed information is available in the respective manufacturer's documentation (e.g. product data sheets).

Note: For companies to declare their products within the scope of this EPD it is not sufficient to simply comply with the product composition shown above. The application of this EPD is only possible for member companies of DBC, EFCC, FEICA, and IVK member associations and only for specific formulations with a total score below the declared maximum score for a product group according to the associated guidance document.

1. substances from the 'Candidate List of Substances of Very High Concern for Authorisation' (SVHC)

This product contains substances listed in the candidate list (date: 14.06.2023) exceeding 0.1 percentage by mass: no.

2. CMR substances in categories 1A and 1B

This product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

3. Biocide products added to the construction product

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): yes. EGOSILICON 151 contains 4,5-dichloro-2-octyl-2H-isothiazol-3-one.

2.6 Manufacture

Silicone-based products are generally manufactured by mixing the ingredients and then filling them into the delivery containers.

2.7 Environment and health during manufacturing

As a general rule, no other environmental or health protection measures other than those specified by law are necessary.

2.8 Product processing/Installation

One-component silicone-based products are usually processed manually on site using suitable tools. In most cases, the products are inserted into joints using cartridge guns, whereby health and safety measures (gloves and goggles, ventilation) are to be taken and consistently adhered to in accordance with the information on the safety data sheet and conditions on site. VOC emissions may occur. Two-component silicone products are processed on the job site by using mix cartridges with static mixers. On the shop floor, two-component dosing & mixing equipment is used (static or dynamic mixers) and the mixed product can be applied manually or fully automatically by a sealing robot.

2.9 Packaging

A detailed description of packaging is provided in section 2.4. Empty containers and clean foils can be recycled.

2.10 Condition of use

During the use phase, silicone-based products are fully cross-linked and hardened.

They are durable products which protect buildings and significantly contribute towards their appearance, function and long-term value.

2.11 Environment and health during use

Option 1 – Products for applications outside indoor areas with permanent stays by people

During use, silicone-based products lose their reactive capacity and are inert. No risks are known for water, air and soil if the products are used as designated.

Option 2 – Products for applications inside indoor areas with permanent stays by people

When used in indoor areas with permanent stays by people, evidence of the emission performance of construction products in contact with indoor air must be submitted according to national requirements. No further influences on the environment and health by emanating substances are known.

2.12 Reference service life

Sealants fulfil key functions in buildings. They decisively improve the usability of building structures and significantly extend their original service lives. Information supplied by the manufacturer on maintenance and care must be observed.

2.13 Extraordinary effects

Fire

Even without any special fire safety features, joint sealants comply with at least the requirements of EN 13501-1 for fire class E.

In terms of volumes used, sealants generally have no or only a minor influence on the fire characteristics (e.g. smoke gas development) of the building in which they are applied.

Water

Silicone-based products are insoluble in water. They are often used to protect building structures from harmful water ingress or the effects of flooding.

Mechanical destruction

The mechanical destruction of silicone-based products does not lead to any decomposition products which are harmful to the environment or health.

2.14 Re-use phase

According to present knowledge, no environmentally hazardous effects in terms of landfilling are to be generally anticipated through dismantling and recycling of components to which hardened silicone sealants adhere.

2.15 Disposal

Silicone-based products which cannot be recycled can be hardened. Empty containers are directed to the recycling process. Only a low volume of silicone sealants is incurred in the disposal of components in which they are used. Low levels of adhesion do not play any role in terms of disposal. They do not impair the disposal/recycling of other components/building materials.

Hardened residual products mechanically removed from substrates must be disposed of as commercial/site waste. The following waste codes according to the European List of Waste (EWC) (2000/532/EC) can apply:

Product residue: EWC 08 04 09

EWC 08 04 10 with the exception of those covered by EWC 08 04 09

2.16 Further information

More information is available on the manufacturer's product or safety data sheets and is available on the manufacturer's

3. LCA: Calculation rules

3.1 Declared Unit

This EPD refers to the declared unit of 1 kg of silicone-based product, group 2; applied into the building with a density of 1.0 - 1.5 g/cm³ in accordance with the IBU PCR part B for construction sealant.

The results of the Life Cycle Assessment provided in this declaration have been selected from the product with the highest environmental impact (worst-case scenario).

Depending on the application, a corresponding conversion factor such as the density to convert volumetric use to mass must be taken into consideration.

The Declaration type is according to EN 15804: Cradle to gate with options, modules C1–C3, and module D (A1– A3, C, D) and additional modules (A4–A5).

Declared unit

Name	Value	Unit
Declared unit	1	kg
Gross density	1-1.5	g/cm ³

3.2 System boundary

Modules A1, A2 and A3 are taken into consideration in the LCA:

- A1 Production of preliminary products
- A2 Transport to the plant
- A3 Production incl. provision of energy, production of packaging as well as auxiliaries and consumables and waste treatment
- A4 Transport to site
- A5 Installation, product applied into the building during A5 phase operations and packaging disposal. This stage considers VOC emissions during the installation phase. The declared products contain substances in(to) the formulation that directly emit as VOC. VOCs are even generated by a chemical reaction that is occurring during this phase.

The end of life for the packaging material considered is described below:

- Incineration, for materials like plastic, paper and wood.
- C1-C2-C3-D

The building deconstruction (demolition process) takes place in the C1 module which considers energy generation and consumption of diesel and all the emissions connected with the fuel-burning process to run the machines. After the demolition, the product is transported to the end-of-life processing (C2 module) where all the impacts related to the transport processes are considered. For the precautionary principle and as a worst-case scenario, thermal treatment is the only end-of-life scenario considered. This is modelled by the incineration process (module C3) where the product ends its life cycle.

Module D accounts for potential benefits that are beyond the defined system boundaries. Credits are generated during the incineration of wastes and related electricity produced that are occurring in the A5 module.

3.3 Estimates and assumptions

For this EPD formulation and production data defined and collected by FEICA were considered. Production waste was assumed to be disposed of by incineration without credits as a worst-case for recovered thermal energy (recovered electricity is looped back within module A1-A3).

An average of plastic containers and wooden pallets was considered in the LCA.

3.4 Cut-off criteria

All raw materials submitted for the formulations and production data were taken into consideration.

The manufacture of machinery, plant and other infrastructure required for the production of the products under review was not taken into consideration in the LCA.

Transport of packaging materials is excluded.

3.5 Background data

Data from the *GaBi* database SP40 (2020) was used as background data.

3.6 Data quality

Representative products were applied for this EPD and the product in the group displaying the highest environmental impact was selected for calculating the LCA results. The background datasets used are less than 4 years old.

Production data and packaging are based on details provided by the manufacturer. The formulation used for evaluation refers to a specific product.

The data quality of the background data is considered to be good.

3.7 Period under review

Representative formulations are valid for 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: Europe

3.9 Allocation

Mass allocation has been applied when primary data have been used and implemented into the LCA model.

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 *GaBi* database SP40 (2020) was used.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon



The packaging materials contain biogenic carbon which is presented below.

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.024	kg C

Note: 1kg of biogenic carbon is equivalent to 44/12 lg of CO₂. For the preparation of building life cycle assessments, it must be taken into account that in module A5 (installation in the building) the biogenic amount of CO₂ (0.024 kg C * 3.67 = 0.088 kg CO₂-eq.) of the packaging bound in modules A1-A3 is mathematically booked out.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	1000	km
Gross weight	34 - 40	t
Payload capacity	27	t

Installation into the building (A5)

Name	Value	Unit
Other resources for packaging material	0.225	kg
Material loss	0.01	kg

Material loss considers the amount of product not used during the application phase into the building. This amount is 1 % of the product and, impacts related to the production of this part are assigned to the A5 module. This percentage is considered as waste to disposal and impacts of its end of life have been considered in the LCA model and declared in A5.

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	0.98	kg
Incineration	0.98	kg

5. LCA: Results

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg of silicone-based product, group 2

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
GWP-total	kg CO ₂ eq	6.82E+00	5.87E-02	6.91E-01	2.73E-04	1.21E-02	4.55E-01	-6.18E-01
GWP-fossil	kg CO ₂ eq	6.91E+00	5.81E-02	5.77E-01	2.61E-04	1.16E-02	4.21E-01	-6.17E-01
GWP-biogenic	kg CO ₂ eq	-9.86E-02	1.7E-04	1.15E-01	1.21E-05	5.31E-04	3.46E-02	-1.42E-03
GWP-luluc	kg CO ₂ eq	6.96E-03	4.7E-04	7.39E-05	6.27E-09	2.74E-07	3.43E-05	-4.07E-04
ODP	kg CFC11 eq	2.08E-13	6.98E-18	2.14E-15	2.78E-20	1.21E-18	2.96E-16	-6.05E-15
AP	mol H ⁺ eq	2.96E-02	1.74E-04	3.7E-04	3.53E-06	3.66E-05	5.15E-04	-8.36E-04
EP-freshwater	kg P eq	1.16E-05	1.77E-07	1.25E-07	5.64E-11	2.46E-09	1.02E-07	-7.49E-07
EP-marine	kg N eq	4.76E-03	7.75E-05	6.65E-05	1.6E-06	1.68E-05	1.97E-04	-2.19E-04
EP-terrestrial	mol N eq	5.19E-02	8.68E-04	8.67E-04	1.75E-05	1.85E-04	2.47E-03	-2.35E-03
POCP	kg NMVOC eq	1.91E-02	1.53E-04	2.97E-02	4.81E-06	3.32E-05	5.11E-04	-6.32E-04
ADPE	kg Sb eq	2.17E-04	4.16E-09	2.17E-06	7.9E-12	3.45E-10	4.52E-09	-9.7E-08
ADPF	MJ	1.25E+02	7.73E-01	1.34E+00	3.73E-03	1.63E-01	5.41E-01	-1.04E+01
WDP	m ³ world eq deprived	2.24E+00	5.19E-04	8.22E-02	5.16E-07	2.25E-05	1.54E-01	-6.01E-02

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

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg of silicone-based product, group 2

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PERE	MJ	5.03E+01	4.35E-02	1.43E+00	1.18E-05	5.14E-04	9.18E-02	-2.15E+00
PERM	MJ	9.05E-01	0	-9.05E-01	0	0	0	0
PERT	MJ	5.12E+01	4.35E-02	5.3E-01	1.18E-05	5.14E-04	9.18E-02	-2.15E+00
PENRE	MJ	1.05E+02	7.74E-01	8.96E+00	3.74E-03	1.63E-01	1.34E+01	-1.04E+01
PENRM	MJ	2.04E+01	0	-7.62E+00	0	0	-1.28E+01	0
PENRT	MJ	1.25E+02	7.74E-01	1.34E+00	3.74E-03	1.63E-01	5.41E-01	-1.04E+01
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m ³	6.92E-02	5.03E-05	2.09E-03	2.11E-08	9.22E-07	3.63E-03	-2.49E-03

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

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg of silicone-based product, group 2

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
HWD	kg	9.98E-07	3.6E-08	1.01E-08	3.63E-13	1.58E-11	1.73E-09	-4.15E-09
NHWD	kg	1.72E+00	1.18E-04	2.19E-02	3.82E-07	1.67E-05	1.34E-01	-4.68E-03
RWD	kg	5.16E-03	9.58E-07	5.69E-05	4.01E-09	1.75E-07	2.46E-05	-7.33E-04
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0
EEE	MJ	0	0	1.24E+00	0	0	0	0
EET	MJ	0	0	2.22E+00	0	0	0	0



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

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 kg of silicone-based product, group 2**

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PM	Disease incidence	ND	ND	ND	ND	ND	ND	ND
IR	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	ND	ND	ND	ND	ND	ND	ND
SQP	SQP	ND	ND	ND	ND	ND	ND	ND

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

Potential Human exposure efficiency relative to U235, Disclaimer 1 – 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.

ADP minerals & metals, ADP fossil, WDP, ETF-fw, HTP-c, HTP-nc, SQP, Disclaimer 2 – 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.

Additional environmental impact indicators (suggested by EN15804, table 4) are not declared in the EPD. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high and as there is limited experience with the indicator (see ILCD classification in EN 15804, table 5). For this reason, results based on these indicators are not considered suitable for a decision-making process and are thus not declared in the EPD.

6. LCA: Interpretation

The majority of impacts are associated with the production phase (A1-A3). The most significant contribution to the production phase impacts is the upstream production of raw materials as a main driver. Another contributor in the production phase, in the category of Photochemical ozone formation (POCP), is the plastic used as a packaging material. Emissions associated with the manufacturing of products also have a high influence on Ozone Depletion Potential (ODP) in the production phase. In all EPDs, CO₂ is the most important contributor to Global Warming Potential (GWP). For the Acidification Potential (AP), NO_x and SO₂ contribute the largest share.

The majority of life cycle energy consumption takes place during the production phase (A1-A3). Significant contributions to Primary Energy Demand – Non-renewable (PENRT) come from the energy resources used in the production of raw materials. The largest contributor to Primary Energy Demand – Renewable (PERT) impacts comes from the consumption of renewable energy resources required for the generation and supply of electricity. It should be noted that Primary Energy Demand – Renewable (PERT) generally

represents a small percentage of the production phase primary energy demand with the bulk of the demand coming from non-renewable energy resources.

Transportation to the construction site (A4) and the installation process (A5) make a low contribution to the overall impacts. Climate change from land use change is the only indicator influenced by transport processes, due to the diesel production used as fuel because part of this diesel has been produced from bio-based raw materials.

The installation phase influence mainly Photochemical ozone formation indicator, due to the emission of VOC during the operations. These emissions are not only directly related to the pre-products in the resins, but they are related to the reaction products between pre-products and air components (water and oxygen).

The end-of-life phases influence climate change indicators, due to the thermal treatment process of the silicon-based products occurring in the C3 module.

7. Requisite evidence

VOC

EGOSILICON 151 was tested on behalf of EGOSILICON 100, EGOSILICON 110, EGOSILICON 111 and EGOSILICON 120 in accordance with the test criteria "AgBB Ausschuss für die gesundheitliche Bewertung von Bauprodukten". The assessment is based on the "Procedure for the health assessment of the emission of volatile organic compounds (VVOC, VOC and SVOC) from building products" of the Committee for Health-related Evaluation of Building Products (AgBB 2018). ecoINSTITUT Germany GmbH carried out the test and confirmed in its report dated 8 November 2019 that the requirements according to AgBB was achieved as the test target.

The table below shows the measured results and the corresponding assessment based on AgBB requirements.

Prüfparameter	Ergebnis	Anforderung	Anforderung erfüllt [ja/heim]
Emissionsanalysen			
Messzeitpunkt: 3 Tage nach Prüfkammerbeladung			
Summe VOC (C ₁ -C ₁₀) und SVOC mit NIK ¹⁾	0,39 mg/m ³	≤ 10 mg/m ³	ja
Summe Kanzerogene (EU-Kat. 1A und 1B)	< 0,001 mg/m ³	≤ 0,01 mg/m ³	ja
Messzeitpunkt: 28 Tage nach Prüfkammerbeladung			
Summe VOC (C ₁ -C ₁₀) und SVOC mit NIK ¹⁾	0,03 mg/m ³	≤ 1 mg/m ³	ja
Summe SVOC ohne NIK (C ₁₁ -C ₂₂) ¹⁾	< 0,005 mg/m ³	≤ 0,1 mg/m ³	ja
R-Wert (dimensionslos)	0,02	≤ 1	ja
Summe VOC ohne NIK	0,011 mg/m ³	≤ 0,1 mg/m ³	ja
Summe Kanzerogene (EU-Kat. 1A und 1B)	< 0,001 mg/m ³	≤ 0,001 mg/m ³	ja

¹⁾ bei der Summe VOC (C₁-C₁₀) und bei der Summe SVOC (C₁₁-C₂₂) werden nur Substanzen ≥ 5 µg/m³ berücksichtigt

8. References

ETAG 002-1

ETAG 002-1:2012 (used as EAD)

Structural Sealant Glazing Kits (SSGK) – Part 1: Supported and unsupported Systems

RAL UZ 123

RAL UZ 123:2019 Basis for awarding the "Low-emission sealants for interiors" environmental certificate

EN ISO 7389

EN ISO 7389:2003 Building construction – Jointing products – Determination of elastic recovery of sealants

EN ISO 7390

EN ISO 7390:2003 Building construction – Jointing products – Determination of resistance to flow of sealants

EN ISO 8339

EN ISO 8339: 2005 Building construction – Sealants – Determination of tensile properties (Extension to break)

EN ISO 10563

EN ISO 10563:2017 Building construction – Sealants – Determination of change in mass and volume

EN ISO 10590

EN ISO 10590:2005 Building construction – Sealants – Determination of tensile properties of sealants at maintained extension after immersion in water

EN ISO 10591

EN ISO 10591:2005 Building construction – Sealants - Determination of adhesion/cohesion properties of sealants after immersion in water

EN ISO 11431

EN ISO 11431:2002 Building construction – Jointing products – Determination of adhesion/cohesion properties of sealants after exposure to heat, water and artificial light through glass

EN 13501-1

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

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15651-1

EN 15651-1:2012 Sealants for non-structural use in joints in buildings and pedestrian walkways – Part 1: Sealants for

façade elements

EN 15651-2

EN 15651-2:2012 Sealants for non-structural use in joints in buildings and pedestrian walkways– Part 2: Sealants for glazing

EN 15651-3

EN 15651-3:2012 Sealants for non-structural use in joints in buildings and pedestrian walkways – Part 3: Sealants for sanitary joints

EN 15651-4

EN 15651-4:2012 Sealants for non-structural use in joints in buildings and pedestrian walkways – Part 4: Sealants for pedestrian walkways

EN 15804

EN 15804+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

Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air

EN ISO 17025

EN ISO 17025: 2018-03

General requirements for the competence of testing and calibration laboratories

2000/532/EC

Commission decision dated 3 May 2000 replacing decision 94/3/EC on a waste directory in accordance with Article 1 a) of Council Directive 75/442/EEC on waste and Council decision 94/904/EC on a directory of hazardous waste in terms of Article 1, paragraph 4 of Directive 91/689/EEC on hazardous waste

Belgian Royal Decree C-2014/24239

Belgisch Staatsblad 8 MEI 2014, p. 60603. — Koninklijk besluit tot vaststelling van de drempelniveaus voor de emissies naar het binnenmilieu van bouwproducten voor bepaalde geoogde gebouwen

Blue Angel

Environmental label organised by the federal government of Germany www.blauer-engel.de **Candidate list** Candidate List of substances of very high concern for Authorisation, published in accordance with Article 59(10) of the REACH Regulation, ECHA, www.echa.europa.eu/candidate-list-table



CPR

CPR Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

Decopaint Directive

Directive 2004/42/CE of the European Parliament and the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC

EMICODE

EMICODE, GEV – Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e. V. (pub.). www.emicode.de

European List of Waste [BSJ1] (EWC) (2000/532/EC)

2000/532/EC: Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance)

GaBi 10

GaBi 10: Software and database for comprehensive analysis. LBP, University of Stuttgart and Sphera, 2020 **GaBi 10**

documentation

Gabi 10: documentation of GaBi 10 data sets from the data base for Life Cycle Engineering LBP, University of Stuttgart and Sphera, <http://documentation.gabi-software.com/>, 2020

German AgBB

Committee for Health-related Evaluation of Building Products: health-related evaluation of emissions of volatile organic compounds (VOC and SVOC) from building products; status: June 2012
www.umweltbundesamt.de/produkte/bauprodukte/agbb.htm

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Indoor Air Comfort

Product certification by Eurofins, Hamburg, Germany
www.eurofins.com

PCR Part A

Product Category Rules for Building-Related Products and Services, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project report, Version 1.1, Institut Bauen und Umwelt e.V., 2021-01

PCR Part B

Product Category Rules for Construction Products, Part B: Building sealants, 2019-04

REACH

Directive (EG) No. 1907/2006 of the European Parliament and of the Council dated 18 December 2006 on the registration, evaluation, approval and restriction of chemical substances (REACH), for establishing a European Agency for chemical substances, for amending Directive 1999/45/EC and for annulment of Directive (EEC) No. 793/93 of the Council, Directive (EC) No. 1488/94 of the Commission, Guideline 76/769/EEC of the Council and Guidelines 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC of the Commission.

The literature referred to in the Environmental Product Declaration must be listed in full. Standards already fully quoted in the EPD do not need to be listed here again. The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.



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