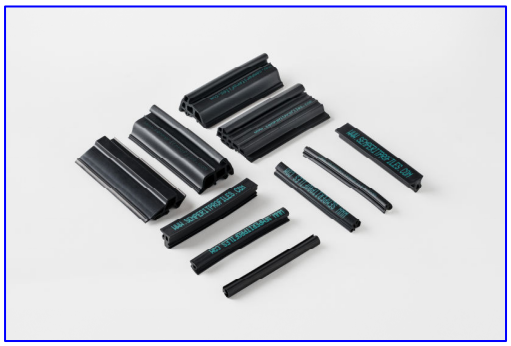
Environmental Product Declaration (EPD)

Declaration Code: EPD-SDI-GB-98.0



SEMPERIT

Semperit Profiles

ECO PLATFORM EPD VERIFIED

EPDM rubber gaskets

Rubber gaskets made of EPDM

EPD © ift Rosenheim

Basis:

DIN EN ISO 14025
EN 15804 + A2

Company EPD
Environmental
Product **D**eclaration

Publication date:
07/05/2026

Valid until:
07/05/2031

www.ift-rosenheim.de/
published EPDs

ift Rosenheim GmbH
Theodor-Gietl-Str. 7-9
83026 Rosenheim
GERMANY

Contact
+49 8031 261-0
info@ift-rosenheim.de
www.ift-rosenheim.de

Testing + Calibration – EN ISO/IEC 17025
Inspection – EN ISO/IEC 17020
Product Certification – EN ISO/IEC 17065
Certification of Management Systems – EN ISO/IEC 17021

Notified Body 0757
PÜZ-Stelle BAY 18

Environmental Product Declaration (EPD)

Declaration Code: EPD-SDI-GB-98.0

Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim		
Practitioner of the LCA	ift Hellas P.C. Palaiokomis GR-56224, Evosmos-Thessaloniki		
Declaration holder	Semperit Profiles Deggendorf GmbH, Land Au 30, 94469 Deggendorf, Germany	Semperit Profiles Leeser GmbH, Ottostraße 25-27, 41836 Hückelhoven-Baal, Germany **www.semperitgroup.com**	
Declaration code	EPD-SDI-GB-98.0		
Designation of declared product	Rubber gaskets made of EPDM		
Scope	Seals made of EPDM rubber for construction elements and industry. Non-cellular elastomer sealing profiles and sealing profiles made of cellular elastomers.		
Basis	This EPD was prepared on the basis of EN ISO 14025:2011, DIN EN 15804:2012+A2:2019 and EN 12365-1:2003 for building hardware – gaskets and weatherstripping. In addition, the “Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen” (Guidance on preparing Type III Environmental Product Declarations) applies. The Declaration is based on the PCR documents EN 17213 “PCR for windows and doors, “PCR Part A” PCR-A-2.0:2025 and "Gasket profiles” PCR-DI-3.0:2023.		
Validity	Publication date: 07/05/2026	Last revision: 07/05/2026	Valid until 07/05/2031
	This verified company Environmental Product Declaration applies solely to the specified products and is valid for a period of five years from the date of publication in accordance with DIN EN 15804.		
LCA basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data includes both, the data collected at the production sites of the company, as describes Table 2 and the generic data from the ”LCA for Experts 10“ database. LCA calculations were carried out for the included “cradle to gate with options” life cycle including all upstream chains (e.g. raw material extraction, etc.).		
Notes	The “Conditions and Guidance on the Use of ift Test Documents” apply. The declaration holder assumes full liability for the underlying data, certificates and verifications.		
Assessment committee	Dr. Torsten Mielecke Chairman of Expert Committee ift-EPD and PCR		
External Verification	Vivien Zwick, External verifier		

1 General product information

Product definition

The EPD relates to the product group EPDM rubber gaskets and applies to:

1 kg of EPDM rubber gaskets made by Semperit Profiles

The declared unit is obtained as follows:

Product group	Declared unit	Bulk density
Product group 1 EPDM Eco	1 kg	1.43 kg/m^3
Product group 2 EPDM Standard	1 kg	1.27 kg/m^3
Product group 3 EPDM and CR Specialities	1 kg	1.58 kg/m^3

Table 1: Product groups

The average unit is declared as follows:
Directly used material flows are determined using masses (kg) produced and assigned to the declared unit. All other inputs and outputs in the production are assigned to the declared unit in their entirety as no typical functional unit is available due to the great diversity of variants.
The reference period is the year 2024.

The validity of the EPD is restricted to the products that have been produced in the plants described below:

No.	Address of the production plant
1.	Semperit Profiles Deggendorf GmbH, Land Au 30, 94469 Deggendorf, Germany
2.	Semperit Profiles Leeser GmbH, Ottostraße 25-27, 41836 Hückelhoven-Baal, Germany
3.	Sempertrans Belchatow SP. z o.o., Wola Grzymalina 11, 97-427 Rogowiec, Poland
4.	Semperit Technische Produkte Gesellschaft GmbH, Bundesstrasse 26A-2632, Wimpassing, Austria

Table 2: Production plants

Production plants number 3 and 4 from Table 2, produce the mixture material that is transferred to production plants number 1 and 2 (Germany), which produce the final product – EPDM rubber gaskets that are considered in our investigation. Mixture material of EPDM is taken into account only as a source of raw materials and as a contribution to the production of the final product, which is the subject of this study.
The investigation also contains restrictions on the production of products that were investigated in the preliminary assessment and are described in the table below:

Product group (PG) 1 EPDM Eco	Product group (PG) 2 EPDM Standard	Product group (PG) 3 EPDM and CR Specialities
EPDM Bau 60 light grey	**EPDM 70 GF**	**EPDM Brand 70 CR**
EPDM Bau 60 grey	EPDM 90	EPDM 80 OK
EPDM Bau 60 silver grey	EPDM 80 KS	EPDM 60 US
EPDM Bau 70 grey (sawable)	EPDM 70 KS	EPDM 70
EPDM 70 silver grey	EPDM Bau 50	EPDM 70 XT
EPDM 70 grey (weldable)	Foamed Rubber P200	EPDM 50
EPDM Bau 70	EPDM Bau 65 S	EPDM 80 XT
EPDM Bau 60 fawn (sawable)	Foamed Rubber P100	EPDM 80 MR
EPDM Bau 60	Foamed Rubber P175/P300	EPDM ABF 70 S
Foamed Rubber S HD	Foamed Rubber P176 XT	EPDM Bau 80
EPDM Bau 70 (sawable)	EPDM 60 XT	EPDM 70 S CoEx
EPDM Moos VPA 2 hard bright	EPDM 60	EPDM 70 SV
EPDM Moos VPA 2 soft bright	EPDM 70 SV	EPDM 85 GL
EPDM Moos VPA 2 middle bright	EPDM 70 MR	
EPDM 70 black (weldable)	EPDM Foamed Rubber S 30	
EPDM 70 (sawable)	EPDM Foamed Rubber S 120	
EPDM 60 + 30% Reclaimed	EPDM Foamed Rubber S 70	
EPDM 70 + 30% Reclaimed	EPDM Flame 70	

Table 3: Product allocations to product groups

Product description

Rubber elastomer seals for sealing liquids, gases, or environmental influences such as rain, wind, noise, etc. in various areas.

The use of EPDM rubber seals saves valuable energy and contributes to the long-term tightness of the buildings.
The rubber profiles are used, for example, in:

- Facades
- Windows & skylights
- Doors of all kinds
- Barrel lid seals

The industries supplied are:

- Construction and building infrastructure

- Household industry
- Packaging industry

Semperit´s customized products are manufactured at production sites in Germany, Austria and Poland and distributed globally. In recent years, they have successfully developed into a recognized R&D partner for industry.

As the European market leader, they are the specialist for rubber seals in the field of construction components and industry. They offer their customers more than just a product – at their request, they accompany them from the development and determination of the most suitable material, through prototyping, to the final series product.

It is an extruded and vulcanized rubber profile.

Product manufacture

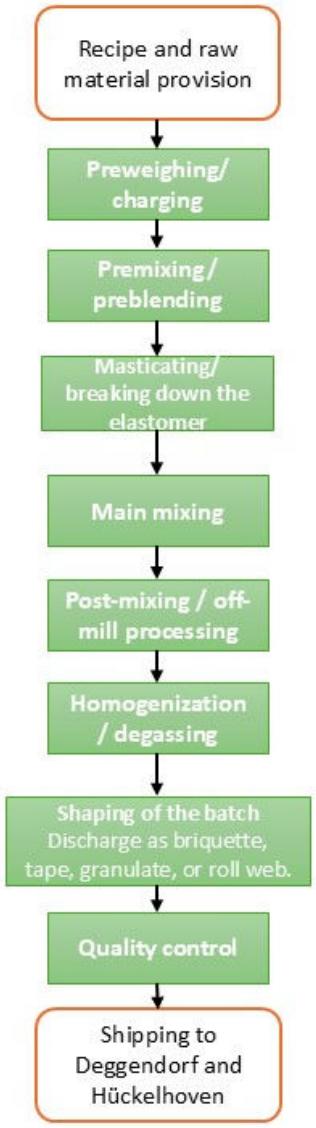


Figure 1: Manufacture process of EPDM mixture material (Poland and Austria)

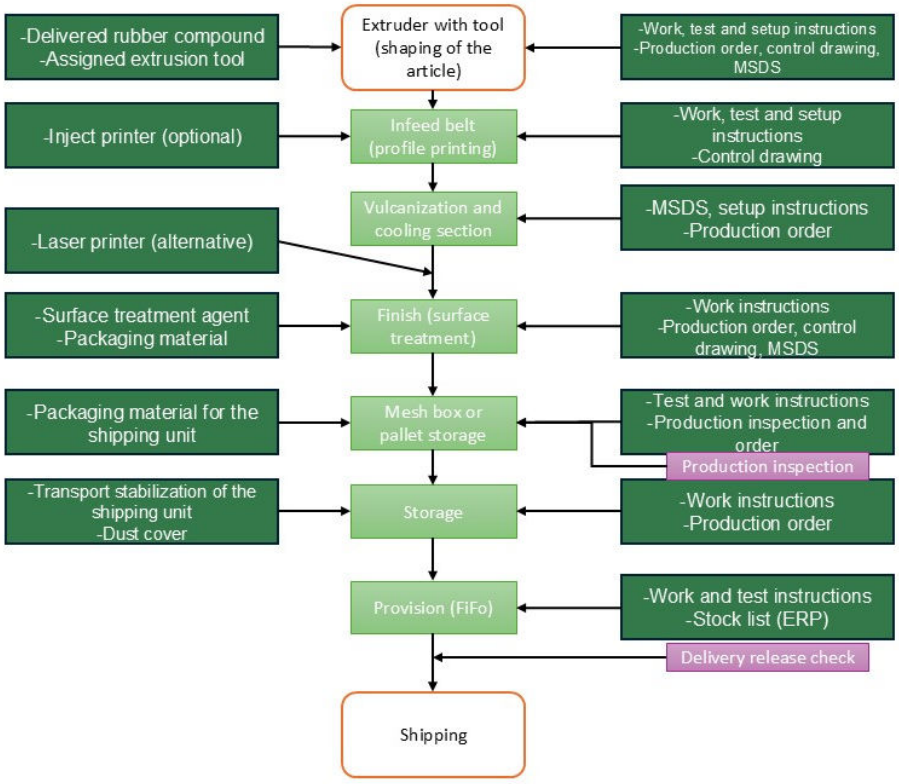


Figure 2: Manufacture process of EPDM rubber gaskets (Deggendorf and Hückelhoven)

Scope

The LCA calculations refer to seals made of EPDM rubber for construction elements and industry.
Non-cellular elastomer sealing profiles and sealing profiles made of cellular elastomers produced by Semperit Profiles.

Verifications

For further and updated verifications (incl. other national approvals) refer to www.semperitgroup.com.

Quality assurance

The following quality assurance systems are in place:

- RAL and Fire protection

Management systems

The following management systems are in place:

- Quality Management System in accordance with DIN EN ISO 9001:2015 (Semperit AG Holding)
- Energy Management System in accordance with DIN EN ISO 50001:2018 (Deggendorf & Hückelhoven)
- Environmental Management System in accordance with DIN EN ISO 14001:2015 (Semperit AG Holding)
- Occupational Health and safety (OH&S) management system in accordance with ISO 45001:2018 (Semperit AG Holding)

Additional information

For additional evidence of fitness for use or certificates of conformity, if applicable, please refer to the CE marking and the documents accompanying the product.

Rubber gaskets made of EPDM are based on DIN 7863/1 and 2, foam rubber thermal insulation profiles.
All performance characteristics were tested by the ift Rosenheim and certified.

2 Materials used

Primary materials

The primary materials used are specified in Section 6.2 Inventory analysis (6.2).

Declarable substances

The product contains no substances from the REACH candidate list (declaration dated 25.02.2025).

All relevant safety data sheets are available from Semperit Profiles

3 Construction process stage

Processing recommendations, installation

Observe the instructions for mounting/installation, operation, maintenance and disassembly, provided by the manufacturer. See www.semperitgroup.com

4 Use stage

Emissions to the environment

Emissions to indoor air, water or soil may occur but they are not known. There may be VOC emissions.

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL shall be specified under defined reference in-use conditions and shall refer to the declared technical and functional performance of the product within the building. It shall be established in accordance with any specific rules given in European product standards, or, if not available, in accordance with a c-PCR. It shall also take into account ISO 15686-1, -2, -7 and -8. Where European product standards or a c-PCR provide guidance on deriving the RSL, such guidance shall have priority.
If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the BBSR table “Nutzungsdauer von Bauteilen zur Lebenszyklusanalyse nach BNB” (service life of building components for life cycle assessment in accordance with the sustainable construction evaluation system) can be used. For further information and explanations refer to www.nachhaltigesbauen.de.

For this EPD the following applies:
For a “Cradle to gate with options” EPD with the modules C1-C4 and module D (A1-A3 + C + D and one or more additional modules from A4 to B7), the reference service life (RSL) can only be stated if the reference in-use conditions are specified.

According to the BBSR table, an optional service life of 20 years is specified for Rubber gaskets made of EPDM made by Semperit Profiles. No 100% scenarios were applied in this investigation.

The service life is dependent on the characteristics of the product and the in-use conditions. The in-use conditions described in the EPD are applicable, in particular the characteristics listed below:

- Outdoor environment: Climatic influences may have a negative impact on the service life
- Indoor environment: No factors (e.g. humidity, temperature) known that may have a negative effect on the service life, however, extreme temperatures, high ozone sources, mechanical stresses, and chemical exposure may still reduce durability.

The service life applies solely to the characteristics specified in this EPD or the corresponding references.
The RSL does not reflect the actual life span, which is usually determined by the service life and the refurbishment of a building. It does not give any information on the useful life, warranty referring to performance characteristics or guarantees.

5 End-of-life stage

Possible end-of-life stages

The Rubber gaskets made of EPDM are shipped to central collection points. There the products are generally shredded and sorted into their original constituents. The end-of-life stage depends on the site where the products are used and is therefore subject to the local regulations. Observe the locally applicable regulatory requirements.

This EPD shows the end-of-life modules according to the market situation.
Plastic components are thermally recycled. Residual fractions are sent to landfill.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle assessments (LCAs) which use material and energy flows for the calculation and subsequent representation of environmental impacts.

Such a life cycle assessment was developed for Rubber gaskets made of EPDM, serving as the basis. The LCA is in conformity with the requirements set out in DIN EN 15804 and the international standards DIN EN ISO 14040, DIN EN ISO 14044 and EN ISO 14025 as well as based on ISO 21930.

The LCA is representative of the products presented in the Declaration and the specified reference period.

6.1 Definition of goal and scope

Goal

The goal of the LCA is to demonstrate the environmental impacts of the products. In accordance with DIN EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented for the entire product life cycle in the form of basic information. Apart from these, no other environmental impacts are specified.

Data quality, data availability and geographical and time-related system boundaries

The specific data originate exclusively from the 2024 fiscal year. They were collected on-site at the plants located as described in Table 2 and come in parts from company records and partly from values directly obtained by measurement. Validity of the data was checked by the ift Rosenheim with onsite visit at Semperit Profiles Deggendorf GmbH, Germany on 24/10/2025.

The generic data come from the “LCA for Experts 10” professional and building materials databases. The last update of both databases was in 2025. Data from before this date come also from these databases and are not more than five years old. No other generic data were used for the calculation.

The generic data selected are as accurate as possible in terms of geographical reference. If no country-specific datasets are available or regional reference cannot be established, European or global datasets are used.

Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.
The quality of data was clasified as “good”, regarding the geographical, technical and temporal representativeness, based on table E.2 of EN 15804.
The life cycle was modelled using the sustainability software tool “LCA for Experts" for the development of life cycle assessments.

The data quality complies with the requirements of EN15941:2024-10.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, production, use and end-of-life stage of Rubber gaskets made of EPDM.
Data from other sites were taken into consideration as described in Table 2.

Cut-off criteria

All the data that the company records, i.e. all commodities/input and raw materials used, the thermal energy used and electricity consumption, were taken into consideration.

The boundaries cover only the product-relevant data. Building sections/parts of facilities that are not relevant to the manufacture of the products, were excluded.

The transportation of raw, ancillary and packaging materials is made by a truck-trailer (34-40 t total weight, 27 t payload), means of transport uses an EURO 0-6 mix. The 34-40 t truck uses 61% of the capacity (according to standard dataset). The Euro standard mix and capacities used are representative of the usual supply chain situations and can therefore be applied.

All transports of the raw, ancillary and packaging materials used in the upstream processes and to the processor are included in the life cycle assessments.
For the EPDM rubber gasket's production, the transport distances for ancillary materials and packaging materials are not recorded by the company (except for H1-Lubricants) but are covered by the life cycle assessment in the assumed transport mix. With the except of the reusable packaging materials return. The recorded transport distances indicated are average values.
For ancillary materials for the gaskets the German ift transport mix of 800 km is used and for packaging materials the European ift transport mix of 2900 km is used.

For the production of mixture EPDM material the European ift transport mix of 2900km is used to describe the transport distances of raw materials. No packaging materials, ancillary materials and wastes are used for the production of mixture, so no transport distances of them are relevant.

The transport of waste in A3 is presented by the following standard scenario:

Means of transport, capacity utilisation, transport km
Transport to collection point using 34-40 t truck (Euro 0-6 mix), diesel, 27 t payload, 50% capacity used

Table 4: Balanced disposal scenario for waste in A3

The criteria for the exclusion of inputs and outputs as set out in DIN EN 15804 are fulfilled. From the data analysis it can be assumed that the total of negligible processes per life cycle stage does not exceed 1% of the mass/primary energy. All in all, the total of negligible processes does not exceed 5% of the energy and mass input. The life cycle calculation also includes material and energy flows that account for less than 1%.

6.2 Inventory analysis

Goal

All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared unit.

Life cycle stages

The Annex shows the entire life cycle of Rubber gaskets made of EPDM. The “Product stage” (A1 - A3), “Construction process stage” (A4 - A5), “Use stage” (B2 - B7), “End-of-life stage” (C1 - C4) and the “Benefits and loads beyond the system boundaries” (D) are considered.

Benefits

The below benefits have been defined in accordance with DIN EN 15804:

- Benefits from recycling
- Benefits (thermal and electrical) from incineration

Allocation of co-products

The manufacture does not give rise to allocations.

Allocations for reuse, recycling and recovery

If the products are reused/recycled and recovered during the product stage (rejects) the components are shredded if necessary and then sorted into their single constituents. This is done by various process plants, e.g. magnetic separators.
The system boundaries were set following their disposal, reaching the end-of-waste state.

Allocations beyond life cycle boundaries

The use of recycled materials in the manufacturing process was based on the current market-specific situation. A recycling potential that reflects the economic value of the product after recycling (recyclate) was also taken into account .
Secondary material stated as input into the production process for the packaging materials, is calculated in module A1 without loads. No benefits are allocated to module D, but consumption is allocated to module A5 (worst case scenario).
More specific, the Protective film foils are used as 100% recycled-secondary material and the cardboard as 81.8% recycles secondary material in the packaging.
The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material by Semperit Profiles was considered in module A1. Secondary material was used only for packaging materials and more specifically in the case of use for the protective film-foils (PE) (100% from recycling materials) and the cardboards (81.8% from recycling materials). The proportion of packaging (based on secondary materials) in total packaging materials per 1 kg of EPDM rubber gaskets is presented in Table 11.

Exceptions are the products "EPDM 60 +30% Reclaimed" and "EPDM 70 +30% Reclaimed," which contain 30% recycled EPDM material and are part of product group 1. No separate life cycle analysis was performed for these specific products.

Inputs

The LCA includes the following production-relevant inputs per 1 kg of EPDM rubber gaskets:

Energy

Market-based approach was used for energy consumption, taking into account the energy consumption from the suppliers of each product.
The natural gas input material is based on ”Thermal energy from natural gas (RER)“ (natural gas mix Europe). The Liquefied petroleum gas (LPG) energy is based on “Thermal energy from LPG Sphera (RER)”. The electricity mix of the plant is based on ”Electricity grid mix Sphera (RER)” (electricity mix Europe). The diesel and gasoline input energy is based on “Diesel mix at filling station with DEF GWPb-Correction (RER)”.

Type of energy use	Shares in %
Electricity grid mix	55.46
Natural gas	43.87
Diesel	0.12
LPG	0.51
Petrol	0.04

Table 5: Energy mix share

Electricity mix / gas mix used	Total	Unit
Electricity grid mix (RER)	0.32	kg CO_2-eq. / kWh
Thermal energy from natural gas (RER)	0.91	kg CO_2-eq. / MJ

Table 6: Greenhouse gas emissions from the use of electricity/gas in the manufacturing phase

A portion of the process heat is used for space heating. This can, however, not be quantified and a “worst case” figure was taken into account for the product.

Water

6.14 kg (per 1kg of product) water consumed by the individual process steps for the production.
The consumption of freshwater specified in Section 6.3 originates (among others) from the process chain of the pre-products and the process water used for cooling.

Raw material/pre-products

The chart below shows the share of raw materials in %.

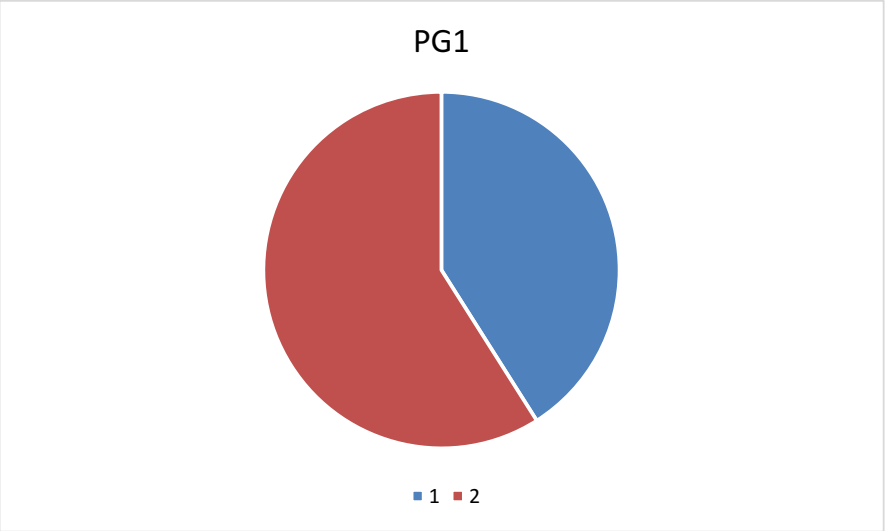


Figure 3: Percentage of individual materials per kg for EPDM Eco

No.	Material	Mass in %
1	Base materials	41.0
2	Additives	59.0

Table 7: Percentage (%) and weight (kg) of individual materials per kg for EPDM Eco

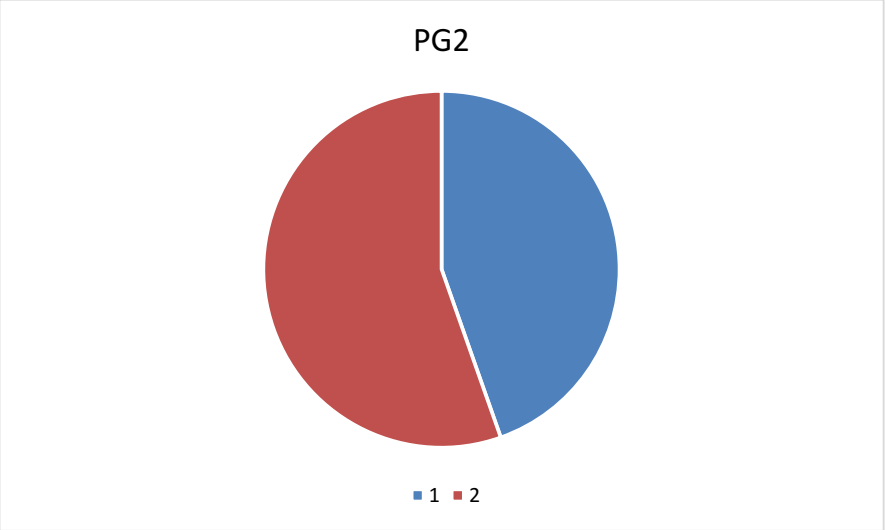


Figure 4: Percentage of individual materials per kg for EPDM Standard

No.	Material	Mass in %
1	Base materials	44.6
2	Additives	55.4

Table 8: Percentage (%) and weight (kg) of individual materials per kg for EPDM Standard

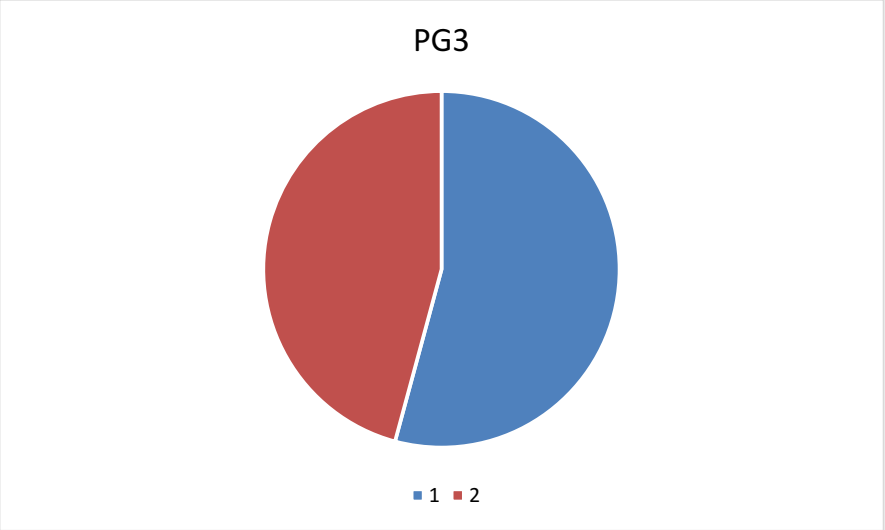


Figure 5: Percentage of individual materials per kg for EPDM and CR Specialities

No.	Material	Mass in %
1	Base materials	54.2
2	Additives	45.8

Table 9: Percentage (%) and weight (kg) of individual materials per kg for EPDM and CR Specialities

Ancillary materials and consumables

Around 15.3g of ancillary materials and consumables are used.

Product packaging

The amounts used for product packaging are as follows:

No.	Material	Mass in kg per Product Group		
		EPDM Eco	EPDM Standard	EPDM and CR Specialities
1	Foil and protective covers (secondary-recycled material)	2.70E-03	2.70E-03	2.70E-03
2.1	Cardboard (regular raw material)	1.23E-02	1.23E-02	1.23E-02
2.2	Cardboard (secondary material) – 81.8% of the total cardboard´s mass	5.54E-02	5.54E-02	5.54E-02
3	Liners (Plastic – PE)	7.66E-05	7.66E-05	7.66E-05
4	Adhesive tape (Plastic – PP)	1.49E-04	1.49E-04	1.49E-04
5	Reusable packaging (Wooden pallets, plastics)	3.22E-02	3.22E-02	3.22E-02

Table 10: Weight in kg of packaging materials per 1 kg of EPDM rubber gaskets

The table below shows the percentage of secondary packaging materials (PE protective films and cardboards) compared to other packaging materials:

Type of packaging material	Share in the total mass of packaging (kg)	Share in the total mass of packaging (%)
Secondary packaging materials (recycled PE foils and cardboards)	5.81E-02	56.5
Reusable packaging (Wooden pallets, plastics)	1.26E-02	31.3
Rest of the packaging materials	3.22E-02	12.2

Table 11: Share of packaging materials per 1kg of EPDM rubber gaskets

Biogenic carbon content

Only the biogenic carbon content of the associated packaging is specified, as the total mass of substances containing biogenic carbon is less than 5% of the total mass of the product and associated packaging.

Wooden pallets are not included in biogenic carbon calculations because the production process of the reusable packaging is not considered in this LCA investigation.

In accordance with EN 16449, packaging produces the following amounts of biogenic carbon:

No	Component	Content in kg C per m²		
		PG1	PG2	PG3
1	Associated packaging	2.43E-02	2.43E-02	2.43E-02

Table 12: Total biogenic carbon content of packaging at gate
Note: 1 kg C corresponds to 44/12 kg CO_2 eq. of biogenic carbon

GWP-b values resulting from the sequestration and release of biogenic carbon were calculated specifically for each life cycle module and are listed in Table 10. The overall results table presented in this document, issued by "LCA for Experts", has not been changed.

Binding and release of CO_2 emissions in kg CO_2-eqv.					
Product group	A1-A3	A5	C3	C4	D
PG1	- 8.92E-02	+ 8.92E-02	0	0	0
PG2	- 8.92E-02	+ 8.92E-02	0	0	0
PG3	- 8.92E-02	+ 8.92E-02	0	0	0

Table 13: Binding and release of biogenic CO_2 emissions in kg CO_2-eqv. from packaging per life cycle module
Note: 1 kg C corresponds to 44/12 kg CO_2-eqv. of biogenic carbon

Outputs

The LCA includes the following production-relevant outputs per 1 kg of **EPDM rubber gaskets**:

Waste
Secondary raw materials were included in the benefits.
See Section 6.3 Impact assessment.

Waste water
The manufacture produces approximately 0.6 kg of waste water.

6.3 Impact assessment

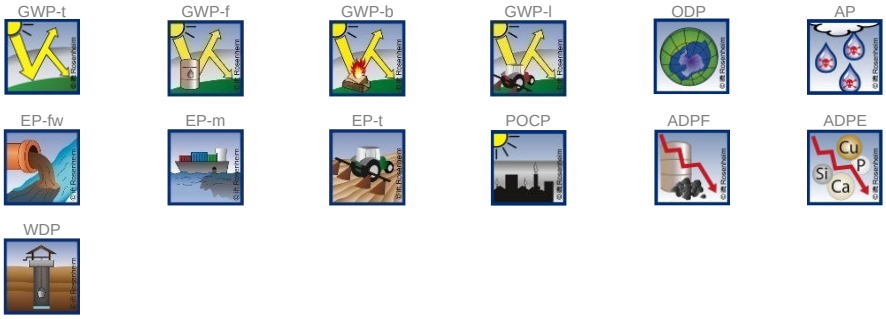
Goal

The impact assessment covers both inputs and outputs. The impact categories applied are named below:

Core indicators

The models for impact assessment were applied as described in DIN EN 15804+A2.
The impact categories presented in the EPD as core indicators are as follows:

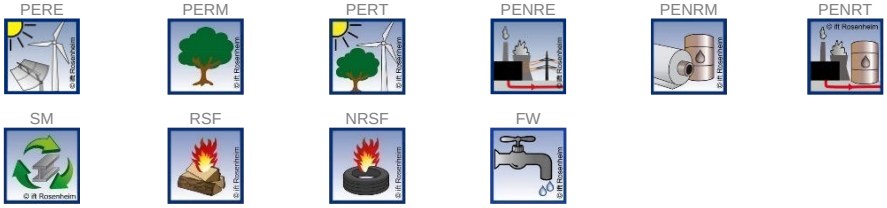
- Climate change – total (GWP-t)
- Climate change – fossil (GWP-f)
- Climate change – biogenic (GWP-b)
- Climate change - land use and land use change (GWP-l)
- Ozone depletion (ODP)
- Acidification (AP)
- Eutrophication aquatic freshwater (EP-fw)
- Eutrophication aquatic marine (EP-m)
- Eutrophication terrestrial (EP-t)
- Photochemical ozone creation (POCP)
- Depletion of abiotic resources - fossil fuels (ADPF)
- Depletion of abiotic resources - minerals and metals (ADPE)
- Water use (WDP)



Use of resources

The models for impact assessment were applied as described in DIN EN 15804-A2.
The following parameters for the use of resources are shown in the EPD:

- Renewable primary energy as energy source (PERE)
- Renewable primary energy for material use (PERM)
- Total use of renewable primary energy (PERT)
- Non-renewable primary energy as energy resource (PENRE)
- Non-renewable primary energy for material use (PENRM)
- Total use of non-renewable primary energy (PENRT)
- Use of secondary materials (SM)
- Use of renewable secondary fuels (RSF)
- Use of non-renewable secondary fuels (NRSF)
- Net use of freshwater resources (FW)

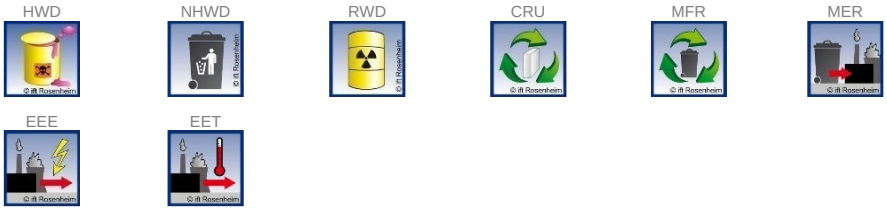


Waste

The waste generated during the production of 1 kg of EPDM rubber gaskets is evaluated and shown separately for the fractions trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products.

The models for impact assessment were applied as described in DIN EN 15804-A2.
The waste categories and indicators for output material flows presented in the EPD are as follows:

- Hazardous waste disposed (HWD)
- Non-hazardous waste disposed (NHWD)
- Radioactive waste disposed (RWD)
- Components for reuse (CRU)
- Materials for recycling (MFR)
- Materials for energy recovery (MER)
- Exported electrical energy (EEE)
- Exported thermal energy (EET)



Additional environmental impact indicators

The models for impact assessment were applied as described in DIN EN 15804-A2.
The additional impact categories presented in the EPD are as follows:

- Particulate matter emissions (PM)
- Ionising radiation, human health (IRP)
- Ecotoxicity – freshwater (ETP-fw)
- Human toxicity - cancer effect (HTP-c)
- Human toxicity - non-cancer effect (HTP-nc)
- Land use related impacts / soil quality (SQP)

Results per 1 kg of EPDM rubber gaskets – EPDM Eco															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	2.02	6.37E-02	1.80E-02	ND	0.00	0.00	0.16	0.00	0.00	0.00	8.89E-02	9.56E-03	2.56	7.65E-04	-0.83
GWP-f	kg CO_2 eq.	2.01	6.06E-02	9.79E-04	ND	0.00	0.00	0.16	0.00	0.00	0.00	8.77E-02	9.10E-03	2.56	7.64E-04	-0.83
GWP-b	kg CO_2 eq.	-7.72E-03	2.48E-03	1.71E-02	ND	0.00	0.00	3.95E-04	0.00	0.00	0.00	9.02E-04	3.72E-04	9.95E-04	-2.48E-06	-4.25E-03
GWP-l	kg CO_2 eq.	2.34E-02	6.18E-04	6.19E-07	ND	0.00	0.00	9.44E-04	0.00	0.00	0.00	2.90E-04	9.28E-05	3.53E-04	3.13E-06	-1.13E-03
ODP	kg CFC-11 eq.	1.01E-11	1.16E-14	2.54E-15	ND	0.00	0.00	2.61E-13	0.00	0.00	0.00	2.00E-12	1.75E-15	2.19E-12	2.13E-15	-7.74E-12
AP	mol H^+ eq.	2.96E-03	8.73E-05	4.98E-06	ND	0.00	0.00	1.09E-04	0.00	0.00	0.00	1.92E-04	1.31E-05	4.37E-04	5.40E-06	-9.73E-04
EP-fw	kg P eq.	4.15E-06	1.62E-07	4.80E-10	ND	0.00	0.00	1.61E-07	0.00	0.00	0.00	1.88E-07	2.44E-08	2.40E-07	1.14E-09	-7.52E-07
EP-m	kg N eq.	8.33E-04	3.64E-05	1.82E-06	ND	0.00	0.00	3.02E-05	0.00	0.00	0.00	4.61E-05	5.45E-06	1.11E-04	1.41E-06	-2.81E-04
EP-t	mol N eq.	9.17E-03	3.71E-04	2.27E-05	ND	0.00	0.00	3.48E-04	0.00	0.00	0.00	5.17E-04	5.57E-05	1.68E-03	1.54E-05	-3.14E-03
POCP	kg NMVOC eq.	2.99E-03	7.95E-05	4.82E-06	ND	0.00	0.00	1.10E-04	0.00	0.00	0.00	1.14E-04	1.19E-05	3.00E-04	4.23E-06	-7.64E-04
ADPF*[2]	MJ	40.71	0.78	5.72E-03	ND	0.00	0.00	1.24	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
ADPE*[2]	kg Sb eq.	9.71E-07	4.01E-09	2.96E-11	ND	0.00	0.00	3.73E-08	0.00	0.00	0.00	1.82E-08	6.03E-10	2.05E-08	4.73E-11	-8.15E-08
WDP*[2]	m^3 world eq. de-prived	0.17	3.01E-04	2.22E-03	ND	0.00	0.00	1.37E-02	0.00	0.00	0.00	2.20E-02	4.52E-05	0.23	8.27E-05	-8.57E-02
Use of resources																
PERE	MJ	5.58	5.88E-02	1.03	ND	0.00	0.00	0.18	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PERM	MJ	1.02	0.00	-1.02	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	6.61	5.88E-02	1.47E-03	ND	0.00	0.00	0.18	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PENRE	MJ	21.52	0.78	0.13	ND	0.00	0.00	1.20	0.00	0.00	0.00	1.79	0.12	20.29	1.00E-02	-14.60
PENRM	MJ	19.19	0.00	-0.13	ND	0.00	0.00	3.81E-02	0.00	0.00	0.00	0.00	0.00	-18.11	0.00	0.00
PENRT	MJ	40.71	0.78	5.72E-03	ND	0.00	0.00	1.24	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
SM	kg	5.08E-02	0.00	0.00	ND	0.00	0.00	2.03E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m^3	7.40E-03	3.02E-05	5.23E-05	ND	0.00	0.00	4.27E-04	0.00	0.00	0.00	9.50E-04	4.53E-06	5.93E-03	2.42E-06	-3.69E-03
Waste categories																
HWD	kg	1.40E-08	3.28E-11	2.92E-12	ND	0.00	0.00	3.89E-10	0.00	0.00	0.00	2.34E-09	4.93E-12	2.55E-09	2.19E-12	-9.19E-09
NHWD	kg	0.21	1.10E-04	6.00E-04	ND	0.00	0.00	1.32E-02	0.00	0.00	0.00	1.39E-03	1.66E-05	7.58E-02	5.00E-02	-7.25E-03
RWD	kg	1.08E-03	1.53E-06	2.84E-07	ND	0.00	0.00	2.32E-05	0.00	0.00	0.00	2.83E-04	2.29E-07	3.04E-04	1.06E-07	-1.09E-03
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	3.56E-04	0.00	0.00	ND	0.00	0.00	1.42E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.45	0.00	2.75E-02	ND	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	3.84	0.00	0.00
EET	MJ	0.80	0.00	4.98E-02	ND	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	6.87	0.00	0.00

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*[2]** - depletion of abiotic resources – fossil fuels **ADPE*[2]** - depletion of abiotic resources – minerals and metals **WDP*[2]** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy
ND – Not declared

	Results per 1 kg of EPDM rubber gaskets – EPDM Eco														
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	3.41E-08	7.93E-10	2.80E-11	ND	0.00	0.00	1.31E-09	0.00	0.00	0.00	1.59E-09	1.19E-10	3.90E-09	6.73E-11	-7.93E-09
IRP*[1]	kBq U235 eq.	0.17	2.16E-04	4.43E-05	ND	0.00	0.00	3.25E-03	0.00	0.00	0.00	4.66E-02	3.25E-05	5.00E-02	1.18E-05	-0.18
ETP-fw*[2]	CTUe	26.36	1.00	2.39E-03	ND	0.00	0.00	1.08	0.00	0.00	0.00	0.30	0.15	0.49	7.75E-03	-1.28
HTP-c*[2]	CTUh	4.93E-10	1.35E-11	1.40E-13	ND	0.00	0.00	1.72E-11	0.00	0.00	0.00	2.85E-11	2.03E-12	4.26E-11	1.33E-13	-1.49E-10
HTP-nc*[2]	CTUh	1.19E-08	7.58E-10	2.72E-12	ND	0.00	0.00	4.64E-10	0.00	0.00	0.00	6.00E-10	1.14E-10	7.22E-10	4.99E-12	-2.46E-09
SQP*[2]	Dimensionless.	10.52	0.34	1.63E-03	ND	0.00	0.00	0.39	0.00	0.00	0.00	0.72	5.11E-02	0.84	2.48E-03	-2.78

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality
ND – Not declared

Disclaimers

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

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

Results per 1 kg of EPDM rubber gaskets – EPDM Standard															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	3.29	6.37E-02	1.80E-02	ND	0.00	0.00	0.21	0.00	0.00	0.00	8.89E-02	9.56E-03	2.56	7.65E-04	-0.83
GWP-f	kg CO_2 eq.	3.27	6.06E-02	9.79E-04	ND	0.00	0.00	0.21	0.00	0.00	0.00	8.77E-02	9.10E-03	2.56	7.64E-04	-0.83
GWP-b	kg CO_2 eq.	5.98E-03	2.48E-03	1.71E-02	ND	0.00	0.00	9.43E-04	0.00	0.00	0.00	9.02E-04	3.72E-04	9.95E-04	-2.48E-06	-4.25E-03
GWP-l	kg CO_2 eq.	1.94E-02	6.18E-04	6.19E-07	ND	0.00	0.00	7.84E-04	0.00	0.00	0.00	2.90E-04	9.28E-05	3.53E-04	3.13E-06	-1.13E-03
ODP	kg CFC-11 eq.	1.08E-11	1.16E-14	2.54E-15	ND	0.00	0.00	2.89E-13	0.00	0.00	0.00	2.00E-12	1.75E-15	2.19E-12	2.13E-15	-7.74E-12
AP	mol H^+ eq.	4.85E-03	8.73E-05	4.98E-06	ND	0.00	0.00	1.85E-04	0.00	0.00	0.00	1.92E-04	1.31E-05	4.37E-04	5.40E-06	-9.73E-04
EP-fw	kg P eq.	4.80E-06	1.62E-07	4.80E-10	ND	0.00	0.00	1.87E-07	0.00	0.00	0.00	1.88E-07	2.44E-08	2.40E-07	1.14E-09	-7.52E-07
EP-m	kg N eq.	1.07E-03	3.64E-05	1.82E-06	ND	0.00	0.00	3.97E-05	0.00	0.00	0.00	4.61E-05	5.45E-06	1.11E-04	1.41E-06	-2.81E-04
EP-t	mol N eq.	1.15E-02	3.71E-04	2.27E-05	ND	0.00	0.00	4.42E-04	0.00	0.00	0.00	5.17E-04	5.57E-05	1.68E-03	1.54E-05	-3.14E-03
POCP	kg NMVOC eq.	3.92E-03	7.95E-05	4.82E-06	ND	0.00	0.00	1.47E-04	0.00	0.00	0.00	1.14E-04	1.19E-05	3.00E-04	4.23E-06	-7.64E-04
ADPF*[2]	MJ	68.01	0.78	5.72E-03	ND	0.00	0.00	2.33	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
ADPE*[2]	kg Sb eq.	9.91E-07	4.01E-09	2.96E-11	ND	0.00	0.00	3.81E-08	0.00	0.00	0.00	1.82E-08	6.03E-10	2.05E-08	4.73E-11	-8.15E-08
WDP*[2]	m^3 world eq. de-prived	0.15	3.01E-04	2.22E-03	ND	0.00	0.00	1.29E-02	0.00	0.00	0.00	2.20E-02	4.52E-05	0.23	8.27E-05	-8.57E-02
Use of resources																
PERE	MJ	5.90	5.88E-02	1.03	ND	0.00	0.00	0.19	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PERM	MJ	1.02	0.00	-1.02	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	6.93	5.88E-02	1.47E-03	ND	0.00	0.00	0.19	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PENRE	MJ	34.50	0.78	0.13	ND	0.00	0.00	2.26	0.00	0.00	0.00	1.79	0.12	33.89	1.00E-02	-14.60
PENRM	MJ	33.51	0.00	-0.13	ND	0.00	0.00	6.68E-02	0.00	0.00	0.00	0.00	0.00	-31.71	0.00	0.00
PENRT	MJ	68.01	0.78	5.72E-03	ND	0.00	0.00	2.33	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
SM	kg	5.08E-02	0.00	0.00	ND	0.00	0.00	2.03E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m^3	1.05E-02	3.02E-05	5.23E-05	ND	0.00	0.00	5.50E-04	0.00	0.00	0.00	9.50E-04	4.53E-06	5.93E-03	2.42E-06	-3.69E-03
Waste categories																
HWD	kg	1.55E-08	3.28E-11	2.92E-12	ND	0.00	0.00	4.49E-10	0.00	0.00	0.00	2.34E-09	4.93E-12	2.55E-09	2.19E-12	-9.19E-09
NHWD	kg	2.98E-02	1.10E-04	6.00E-04	ND	0.00	0.00	6.02E-03	0.00	0.00	0.00	1.39E-03	1.66E-05	7.58E-02	5.00E-02	-7.25E-03
RWD	kg	1.13E-03	1.53E-06	2.84E-07	ND	0.00	0.00	2.52E-05	0.00	0.00	0.00	2.83E-04	2.29E-07	3.04E-04	1.06E-07	-1.09E-03
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	3.56E-04	0.00	0.00	ND	0.00	0.00	1.42E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.45	0.00	2.75E-02	ND	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	3.84	0.00	0.00
EET	MJ	0.80	0.00	4.98E-02	ND	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	6.87	0.00	0.00

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*[2]** - depletion of abiotic resources – fossil fuels **ADPE*[2]** - depletion of abiotic resources – minerals and metals **WDP*[2]** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy
ND – Not declared

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Results per 1 kg of EPDM rubber gaskets – EPDM Standard																
Additional environmental impact indicators																
PM	Disease incidence	9.53E-08	7.93E-10	2.80E-11	ND	0.00	0.00	3.76E-09	0.00	0.00	0.00	1.59E-09	1.19E-10	3.90E-09	6.73E-11	-7.93E-09
IRP*[1]	kBq U235 eq.	0.17	2.16E-04	4.43E-05	ND	0.00	0.00	3.49E-03	0.00	0.00	0.00	4.66E-02	3.25E-05	5.00E-02	1.18E-05	-0.18
ETP-fw*[2]	CTUe	45.16	1.00	2.39E-03	ND	0.00	0.00	1.83	0.00	0.00	0.00	0.30	0.15	0.49	7.75E-03	-1.28
HTP-c*[2]	CTUh	8.14E-10	1.35E-11	1.40E-13	ND	0.00	0.00	3.01E-11	0.00	0.00	0.00	2.85E-11	2.03E-12	4.26E-11	1.33E-13	-1.49E-10
HTP-nc*[2]	CTUh	1.83E-08	7.58E-10	2.72E-12	ND	0.00	0.00	7.20E-10	0.00	0.00	0.00	6.00E-10	1.14E-10	7.22E-10	4.99E-12	-2.46E-09
SQP*[2]	Dimensionless.	10.53	0.34	1.63E-03	ND	0.00	0.00	0.39	0.00	0.00	0.00	0.72	5.11E-02	0.84	2.48E-03	-2.78

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality
ND – Not declared

Disclaimers

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

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

Results per 1 kg of EPDM rubber gaskets – EPDM and CR Specialities															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	4.91	6.37E-02	1.80E-02	ND	0.00	0.00	0.27	0.00	0.00	0.00	8.89E-02	9.56E-03	2.56	7.65E-04	-0.83
GWP-f	kg CO_2 eq.	4.87	6.06E-02	9.79E-04	ND	0.00	0.00	0.27	0.00	0.00	0.00	8.77E-02	9.10E-03	2.56	7.64E-04	-0.83
GWP-b	kg CO_2 eq.	3.48E-02	2.48E-03	1.71E-02	ND	0.00	0.00	2.09E-03	0.00	0.00	0.00	9.02E-04	3.72E-04	9.95E-04	-2.48E-06	-4.25E-03
GWP-l	kg CO_2 eq.	7.50E-03	6.18E-04	6.19E-07	ND	0.00	0.00	3.09E-04	0.00	0.00	0.00	2.90E-04	9.28E-05	3.53E-04	3.13E-06	-1.13E-03
ODP	kg CFC-11 eq.	4.03E-11	1.16E-14	2.54E-15	ND	0.00	0.00	1.47E-12	0.00	0.00	0.00	2.00E-12	1.75E-15	2.19E-12	2.13E-15	-7.74E-12
AP	mol H^+ eq.	1.24E-02	8.73E-05	4.98E-06	ND	0.00	0.00	4.85E-04	0.00	0.00	0.00	1.92E-04	1.31E-05	4.37E-04	5.40E-06	-9.73E-04
EP-fw	kg P eq.	9.18E-06	1.62E-07	4.80E-10	ND	0.00	0.00	3.62E-07	0.00	0.00	0.00	1.88E-07	2.44E-08	2.40E-07	1.14E-09	-7.52E-07
EP-m	kg N eq.	2.03E-03	3.64E-05	1.82E-06	ND	0.00	0.00	7.81E-05	0.00	0.00	0.00	4.61E-05	5.45E-06	1.11E-04	1.41E-06	-2.81E-04
EP-t	mol N eq.	2.23E-02	3.71E-04	2.27E-05	ND	0.00	0.00	8.74E-04	0.00	0.00	0.00	5.17E-04	5.57E-05	1.68E-03	1.54E-05	-3.14E-03
POCP	kg NMVOC eq.	6.63E-03	7.95E-05	4.82E-06	ND	0.00	0.00	2.55E-04	0.00	0.00	0.00	1.14E-04	1.19E-05	3.00E-04	4.23E-06	-7.64E-04
ADPF*[2]	MJ	87.29	0.78	5.72E-03	ND	0.00	0.00	3.10	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
ADPE*[2]	kg Sb eq.	5.14E-03	4.01E-09	2.96E-11	ND	0.00	0.00	2.06E-04	0.00	0.00	0.00	1.82E-08	6.03E-10	2.05E-08	4.73E-11	-8.15E-08
WDP*[2]	m^3 world eq. de-prived	0.47	3.01E-04	2.22E-03	ND	0.00	0.00	2.59E-02	0.00	0.00	0.00	2.20E-02	4.52E-05	0.23	8.27E-05	-8.57E-02
Use of resources																
PERE	MJ	19.43	5.88E-02	1.03	ND	0.00	0.00	0.73	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PERM	MJ	1.02	0.00	-1.02	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	20.46	5.88E-02	1.47E-03	ND	0.00	0.00	0.73	0.00	0.00	0.00	1.22	8.83E-03	1.33	1.94E-03	-4.74
PENRE	MJ	67.54	0.78	0.13	ND	0.00	0.00	3.06	0.00	0.00	0.00	1.79	0.12	20.82	1.00E-02	-14.60
PENRM	MJ	19.75	0.00	-0.13	ND	0.00	0.00	3.92E-02	0.00	0.00	0.00	0.00	0.00	-18.64	0.00	0.00
PENRT	MJ	87.29	0.78	5.72E-03	ND	0.00	0.00	3.10	0.00	0.00	0.00	1.79	0.12	2.18	1.00E-02	-14.60
SM	kg	5.82E-02	0.00	0.00	ND	0.00	0.00	2.33E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m^3	2.53E-02	3.02E-05	5.23E-05	ND	0.00	0.00	1.14E-03	0.00	0.00	0.00	9.50E-04	4.53E-06	5.93E-03	2.42E-06	-3.69E-03
Waste categories																
HWD	kg	4.50E-08	3.28E-11	2.92E-12	ND	0.00	0.00	1.63E-09	0.00	0.00	0.00	2.34E-09	4.93E-12	2.55E-09	2.19E-12	-9.19E-09
NHWD	kg	0.19	1.10E-04	6.00E-04	ND	0.00	0.00	1.26E-02	0.00	0.00	0.00	1.39E-03	1.66E-05	7.58E-02	5.00E-02	-7.25E-03
RWD	kg	2.54E-03	1.53E-06	2.84E-07	ND	0.00	0.00	8.14E-05	0.00	0.00	0.00	2.83E-04	2.29E-07	3.04E-04	1.06E-07	-1.09E-03
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	2.36E-04	0.00	0.00	ND	0.00	0.00	9.44E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.51	0.00	2.75E-02	ND	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	3.84	0.00	0.00
EET	MJ	0.92	0.00	4.98E-02	ND	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	6.87	0.00	0.00

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*[2]** - depletion of abiotic resources – fossil fuels **ADPE*[2]** - depletion of abiotic resources – minerals and metals **WDP*[2]** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy
ND – Not declared

Results per 1 kg of EPDM rubber gaskets – EPDM and CR Specialities															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	4.26E-07	7.93E-10	2.80E-11	ND	0.00	0.00	1.70E-08	0.00	0.00	0.00	1.59E-09	1.19E-10	3.90E-09	6.73E-11	-7.93E-09
IRP*[1]	kBq U235 eq.	0.32	2.16E-04	4.43E-05	ND	0.00	0.00	9.41E-03	0.00	0.00	0.00	4.66E-02	3.25E-05	5.00E-02	1.18E-05	-0.18
ETP-fw*[2]	CTUe	56.17	1.00	2.39E-03	ND	0.00	0.00	2.27	0.00	0.00	0.00	0.30	0.15	0.49	7.75E-03	-1.28
HTP-c*[2]	CTUh	1.35E-09	1.35E-11	1.40E-13	ND	0.00	0.00	5.15E-11	0.00	0.00	0.00	2.85E-11	2.03E-12	4.26E-11	1.33E-13	-1.49E-10
HTP-nc*[2]	CTUh	2.91E-08	7.58E-10	2.72E-12	ND	0.00	0.00	1.15E-09	0.00	0.00	0.00	6.00E-10	1.14E-10	7.22E-10	4.99E-12	-2.46E-09
SQP*[2]	Dimensionless.	15.92	0.34	1.63E-03	ND	0.00	0.00	0.60	0.00	0.00	0.00	0.72	5.11E-02	0.84	2.48E-03	-2.78

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality
ND – Not declared

Disclaimers

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

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

6.4 Interpretation, LCA presentation and critical review

Evaluation

Calculation of the scenarios was based on a service life of 20 years. Furthermore, the scenarios of the research project "EPDs für transparente Bauelemente“ (EPDs for transparent building components) were used.
The environmental impacts of

- Product group 1 - EPDM Eco,
- Product group 2 - EPDM Standard and
- Product group 3 - EPDM and CR Specialities

differ considerably. The differences result from the different pre-products and raw materials used from the mass of them. This was to be expected, mainly because of the use of polymer EPDM or chloroprene rubber.

The environmental impacts during the manufacture of product group EPDM Eco result mainly from the use of polymer EPDM or its upstream chains. For EPDM Standard, the main environmental impacts result from the use of carbon black and polymer EPDM and for product group EPDM and CR Specialities mainly due to the use of chloroprene rubber, aluminium hydroxide and carbon black and their specific upstream chains. The energy consumption and the ancillary materials are used as same for the three product groups, so the production process differentiates only from the use of different mixture material.

There are no impacts during the 50-year use stage (except the replacement of EPDM rubber gaskets) so that they can be formulated in the present investigation in terms of environmental impact. Further important parameters in the use stage originate from the replacement of EPDM rubber gaskets over the 50-year period.

For module C4 only marginal consumptions arising from the physical pretreatment and management of the disposal site are expected. Allocation to individual products is almost impossible for site disposal.
As regards the recycling of products and energy, for thermal energy from natural gas and electricity grid mix the percentages of the environmental impacts of the core indicators occurring during the life cycle (without WDP, because without software support) can be assigned as benefits to module D and are presented in the following table in descending order:

Product groups	Benefits in module D (in descending order)	Credits (global) through recycling in Module D (share of environmental impacts, mean value without weighting)
PG1	• Electricity grid mix • Thermal energy from natural gas	10.49 %
PG2	• Electricity grid mix • Thermal energy from natural gas	19.92 %
PG3	• Electricity grid mix • Thermal energy from natural gas	20.86 %

Table 14: Benefits of recycling in module D, per 1kg of each product group

The charts below show the distribution of the main environmental impacts.

The values obtained from the LCA calculation are suitable for the certification of buildings.

Charts

The following charts show the B modules related to the specified RSL during the 50-year building service life.

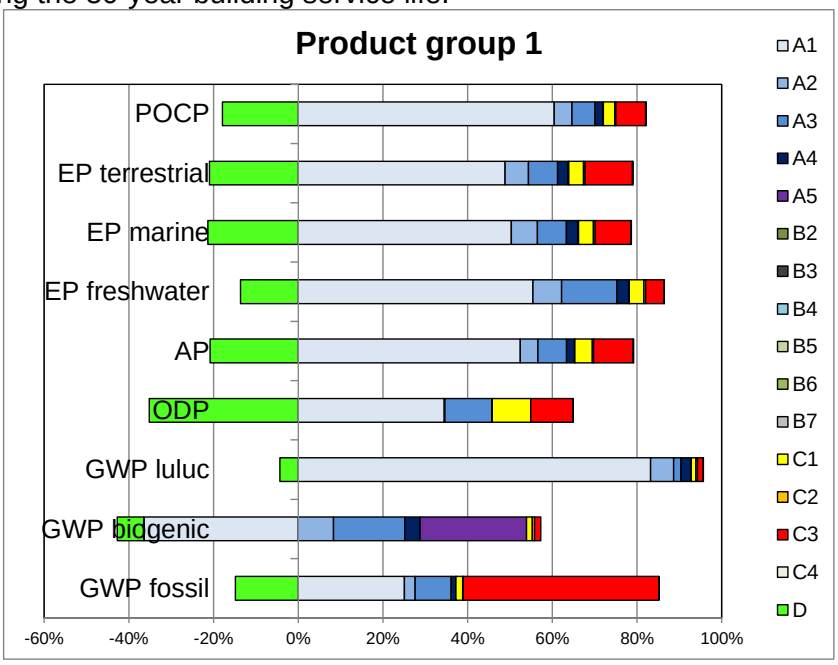


Figure 6: Percentage of the modules in selected environmental impact categories for product group EPDM Eco

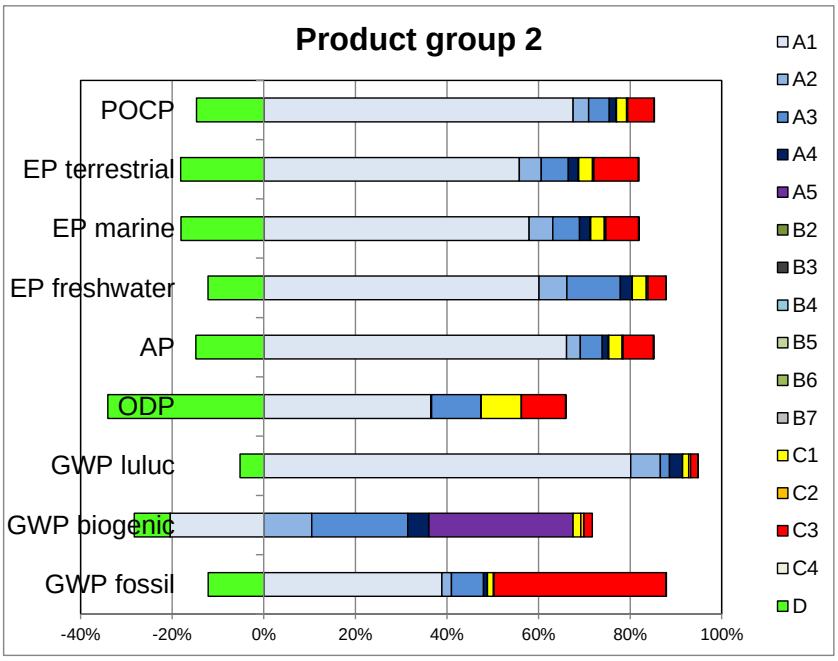


Figure 7: Percentage of the modules in selected environmental impact categories for product group EPDM Standard

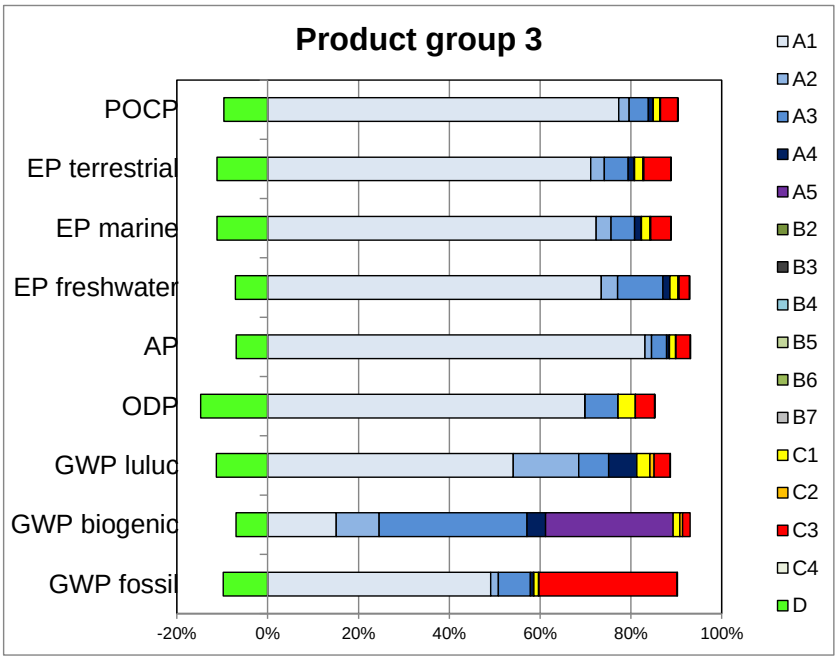


Figure 8: Percentage of the modules in selected environmental impact categories for product group EPDM and CR Specialities

Deviations from worst cases / explanation of averaging

For different production plants, the deviation can be determined as follows:

A separate evaluation of the Hückelhoven and Deggendorf production plants for production of EPDM Eco, EPDM Standard and EPDM and CR Specialities was computed to show the deviation from the worst case. The maximum deviation from the worst case was computed in the right-hand column.

Product group	Parame-ters	Unit	A1-3	Deviation in %	
				Deggendorf	Hückelhoven
PG1	**GWP-t**	kg CO_2 eq.	2.02	-4	+8
PG2	**GWP-t**	kg CO_2 eq.	3.29	-4	+7
PG3	**GWP-t**	kg CO_2 eq.	4.91	-3	+5

Table 15: Deviations from the worst case of the impact assessment results between the production plants for the three product groups

Report

The LCA report underlying this EPD was developed according to the requirements of DIN EN ISO 14040 and DIN EN ISO 14044 as well as DIN EN 15804 and DIN EN ISO 14025. It is not addressed to third parties for reasons of confidentiality. It is deposited with the ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.

Critical review

The critical review of the LCA and the report took place in the course of verification of the EPD and was carried out by Vivien Zwick, an external verifier.

7 General information regarding the EPD

Comparability

This EPD was prepared in accordance with DIN EN 15804 and is therefore only comparable to those EPDs that also comply with the requirements set out in DIN EN 15804.
Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.
For comparing EPDs of construction products, the rules set out in DIN EN 15804 (Clause 5.3) apply.

The reference products included in the balance sheet were identified using the worst-case approach and considered representative of the product group. The results for individual products within the product group differ from the results for the reference products.
The establishment of the product groups and the resulting variations are documented in the background report.

Communication

The communications format of this EPD meets the requirements of EN 15942:2012 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to DIN EN 15804.

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in DIN EN ISO 14025.

The Declaration is based on the PCR documents EN 17213 “PCR for windows and doors, “PCR Part A” PCR-A-2.0:2025 and "Gasket profiles” PCR-DI-3.0:2023

The European standard EN 15804 serves as the core PCR [a)]
Independent external verification of the Declaration and statement according to EN ISO 14025:2010
Independent third party verifier: [b)] [Vivien Zwick]
[a)] Product category rules [b)] Optional for business-to-business communication Mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Revisions of this document

No.	Date	Note:	Practitioner	Verifier
1	13.01.2026	External verification	Margaritis	Zwick
2.	18.02.2026	External verification	Margaritis	Zwick
3.	06.05.2026	Additional table	Margaritis	-

8 Bibliography

Beilicke, G. (2010). *Bautechnischer Brandschutz: Brandlastberechnung (Erw. Reprint, 1. Aufl.).* Leipzig: Beilicke Brandschutz Verlag.

Bundesimmissionsschutzgesetz - BImSchG. (2017). *Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnlichen Vorgängen.* Berlin: BGBI. I S. 3830.

Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR). (2025, 09 25). *Nutzungsdauern von Bauteilen für Lebenszyklusanalysen nach Bewertungssystem Nachhaltiges Bauen (BNB).* Retrieved 10 09, 2025, from https://www.nachhaltigesbauen.de/fileadmin/pdf/Nutzungsdauer_Bauteile/25.09.25_BBSR_Nutzungdsdauern_final_mit_%C3%A4nderungen.xlsx

Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit. (2016). *Leitfaden Nachhaltiges Bauen.* Berlin.

Chemikalien-Verbotsverordnung - ChemVerbotsV. (2017). *Verordnung über Verbote und Beschränkungen des Inverkehrbringens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach Chemikaliengesetz.* Berlin: BGBI. I S. 1328.

DIN 18230-3:2002-08. (2002). *Baulicher Brandschutz im Industriebau - Teil 3: Rechenwerte* . Berlin: DIN Media GmbH.

DIN EN 13501-1:2010-01. (2010). *Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 1: Klassifizierung mit den Ergebnissen aus den Prüfungen zum Brandverhalten von Bauprodukten.* Berlin: Beuth Verlag GmbH.

DIN EN 15804:2012+A2:2019+AC:2021. (2022). *Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Grundregeln für die Produktkategorie Bauprodukte.* Berlin: DIN Media GmbH.

DIN EN 15941:2024-10. (2024). *Nachhaltigkeit von Bauwerken - Datenqualität für die Erfassung der Umweltqualität von Produkten und Bauwerken - Auswahl und Anwendung von Daten.* Berlin: DIN Media GmbH.

DIN EN 15942:2022-04. (2022). *Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Kommunikationsformate zwischen Unternehmen.* Berlin: DIN Media GmbH.

DIN EN 16034:2014-12. (2014). *Fenster, Türen und Tore - Produktnorm, Leistungseigenschaften - Feuer- und/oder Rauchschutzeigenschaften.* Berlin: DIN Media GmbH.

DIN EN 16449:2014-06. (2014). *Wood and wood-based products – Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.* Berlin: Beuth Verlag GmbH.

DIN EN 17213:2020-09. (2020). *Fenster und Türen - Umweltproduktdeklarationen - Produktkategorieregeln für Fenster und Türen.* Berlin: DIN Media GmbH.

DIN EN 17672:2023-04. (2023). *Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Horizontale Regeln für die Kommunikation von Unternehmen an Verbrauchern.* Berlin: DIN Media GmbH.

DIN EN ISO 14025:2011-10. (2011). *Umweltkennzeichnungen und -deklarationen Typ III Umweltdeklarationen - Grundsätze und Verfahren.* Berlin: Beuth Verlag GmbH.

DIN EN ISO 14040:2021-02. (2021). *Umweltmanagement - Ökobilanz - Grundsätze und Rahmenbedingungen.* Berlin: Beuth Verlag GmbH.

DIN EN ISO 14044:2021-02. (2021). *Umweltmanagement - Ökobilanz - Anforderungen und Anleitungen.* Berlin: Beuth Verlag GmbH.

DIN ISO 16000-6:2012-11. (2012). *Innenraumluftverunreinigungen - Teil 6: Bestimmung von VOC in der Innenraumluft und in Prüfkammern, Probenahme auf TENAX TA®, thermische Desorption und Gaschromatografie mit MS/FID.* Berlin: Beuth Verlag GmbH.

EN 12365-1 Building Hardware - Gaskets and weatherstripping for doors, windows, shutters and curtain walling - Part 1: Requirements, definitions and classification. (2003). Brussels: Technical Committee CEN/TC 33.

Engineering Toolbox – Fuel Densities. (n.d.). Retrieved from https://www.engineeringtoolbox.com/fuels-densities-specific-volumes-d_166.html?utm_source=chatgpt.com

Eyerer, P., & Reinhardt, H.-W. (2000). *Ökologische Bilanzierung von Baustoffen und Gebäuden - Wege zu einer ganzheitlichen Bilanzierung.* Basel: Birkhäuser Verlag.

Forest research. (n.d.). Retrieved from www.forestresearch.gov.uk/tools-and-resources/fthr/biomass-energy-resources/reference-biomass/facts-figures/typical-calorific-values-of-fuels

Forschungsvorhaben. (2011). *EPDs für transparente Bauelemente - Abschlussbericht.* Rosenheim: ift Rosenheim GmbH.

Gefahrstoffverordnung - GefStoffV. (2017). *Verordnung zum Schutz vor Gefahrstoffen.* Berlin: BGBI. I S. 3758.

ift Rosenheim GmbH. (2019). *Bedingungen und Hinweise zur Verwendung von ift-Prüfdokumentationen.* Rosenheim.

ift-Richtlinie NA-01/5. (2025). *Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen.* Rosenheim: ift Rosenheim GmbH.

IKP Universität Stuttgart und PE Europe GmbH. (2025). *GaBi 10: Software und Datenbank zur Ganzheitlichen Bilanzierung.* Leinfelden-Echterdingen.

ISO 15686-1:2011-05. (2011). *Hochbau und Bauwerke - Planung der Lebensdauer - Teil 1: Allgemeine Grundlagen und Rahmenbedingungen.* Berlin: DIN Media GmbH.

ISO 15686-2:2012-05 . (2012). *Hochbau und Bauwerke - Planung der Lebensdauer - Teil 2: Verfahren zur Voraussage der Lebensdauer* . Beuth Verlag GmbH.

ISO 15686-7:2017-04. (2017). *Hochbau und Bauwerke - Planung der Lebensdauer - Teil 7: Leistungsbewertung für die Rückmeldung von Daten über die Nutzungsdauer aus der Praxis* . Beuth Verlag GmbH.

ISO 15686-8:2008-06. (2008). *Hochbau und Bauwerke - Planung der Lebensdauer - Teil 8: Referenznutzungsdauer und Bestimmung der Nutzungsdauer* . Beuth Verlag GmbH.

ISO 21930:2017-07. (2017). *Hochbau - Nachhaltiges Bauen - Umweltproduktdeklarationen von Bauprodukten.* Berlin: Beuth Verlag.

Klöpffer, W., & Grahl, B. (2009). *Ökobilanzen (LCA).* Weinheim: Wiley-VCH-Verlag.

Magnum Solvent . (n.d.). Retrieved from https://www.magnumsolvent.com/productdata/Product%20Literature/Heat%20Transfer%20Fluids/Product%20guide%20-%20Ethylene%20Glycol.pdf?utm_source=chatgpt.com

Materials, A. S. (1983). *Oxygen Index Tests to Evaluate the Suitability of a Given Material for Oxygen Service.* USA: American Society for Testing and Materials.

Measurement Canada – LPG Standard Density Values. (n.d.). Retrieved from https://ised-isde.canada.ca/site/measurement-canada/en/v-18-selection-volume-correction-factor-tables-and-standard-density-values-some-common-products?utm_source=chatgpt.com

Measurement Canada – Lubricating Oil Density. (n.d.). Retrieved from https://ised-isde.canada.ca/site/measurement-canada/en/v-18-selection-volume-correction-factor-tables-and-standard-density-values-some-common-products?utm_source=chatgpt.com

Measurement Canada – Standard Density Values. (n.d.). Retrieved from https://ised-isde.canada.ca/site/measurement-canada/en/v-18-selection-volume-correction-factor-tables-and-standard-density-values-some-common-products?utm_source=chatgpt.com

OENORM S 5200:2009-04-01. (2009). *Radioaktivität in Baumaterialien.* Berlin: Beuth Verlag GmbH.

PCR Teil A. (2025). *Allgemeine Produktkategorieregeln für Umweltprodukdeklarationen nach EN ISO 14025 und EN 15804.* Rosenheim: ift Rosenheim.

PCR Teil B - Dichtungsprofile. (2023). *Produktkategorieregeln für Umweltprodukdeklarationen nach EN ISO 14025 und EN 15804.* Rosenheim: ift Rosenheim.

RAL-Gütegemeinschaft Fenster und Haustüren e.V.; ift Insitut für Fenstertechnik. (2024). *Leitfaden zur Planung und Ausführung der Montage von Fenstern und Haustüren.* Frankfurt: RAL-Gütegemeinschaft Fenster und Haustüren e.V.

Schweizer-FN – Density Table of Organic Liquids. (n.d.). Retrieved from https://www.schweizer-fn.de/helpdat/stoff/help_dichte.php?utm_source=chatgpt.com

The Engineering ToolBox. (n.d.). Retrieved from https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d_169.html?utm_source=chatgpt.com

U.S. Wooden Pallet Foundation. (n.d.). Retrieved from National Wooden Pallet & Container Association: https://cdn.ymaws.com/www.palletcentral.com/resource/resmgr/industry_resources/EPD-report-wood-pallets.pdf

9 Annex A

Description of life cycle scenarios for Rubber gaskets made of EPDM

Product stage			Con-struction process stage		Use stage*							End-of-life stage				Benefits and loads from beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/installation process	Use	Maintenance	Repair	Replacement	Modification/refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
✓	✓	✓	✓	✓	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* For the declared B modules, the calculation of the results is based on the specified RSL related to one year.

Table 16: Overview of applied life cycle stages

Calculation of the scenarios was based on a defined RSL (see Section 4 Use stage).

The scenarios were based on information provided by the manufacturer. The scenarios were furthermore based on the research project “EPDs for transparent building components. (Forschungsvorhaben, 2011)

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

- ✓ Included in the LCA
- — Not included in the LCA

A4 Transport

No.	Scenario	Description
A4.1	Small series via distributors	40 t truck (Euro 0-6 mix), diesel, 27 t payload, 50% capacity useEPDM Eco, about 300 km to site and empty return (600 km total distance)

[1] capacity used: used loading capacity of truck

A4 Transport to construction site	Transport weight [kg/m²]	Density [kg/m³]	Volume capacity utilisation factor[2]
PG1	1.103	1.43	< 1
PG2	1.103	1.27	< 1
PG3	1.103	1.58	< 1

Table 17: : A4 Transport weight and density for EPDM rubber gaskets

[2] Volume capacity utilisation factor:
= 1 product completely fills packaging (without air inclusion)
< 1 packaging contains unused volume (e.g.: air, filling material
> 1 product is packed in compressed form

Since only one scenario is used, the results are shown in the relevant summary table.

A5 Construction/installation process

No.	Scenario	Description
A5.1	Manual	According to the manufacturer the products are installed without using additional lifting and auxiliary devices

In case of deviating consumption during installation/assembly of the products which forms part of the site management, they are covered at the construction works level.

Ancillary materials, consumables, use of energy and water, use of other resources, material losses, direct emissions as well as waste materials during installation are negligible.

Is assumed that the module A5 allocates the packaging material to waste handling. Waste is only thermally recycled. Films, foils, protective covers, wood and cardboard in waste incineration plants. Benefits from A5 are specified in module D. Benefits from waste incineration: electricity replaces electricity mix (RER); thermal energy replaces thermal energy from natural gas (RER).
Transport to the recycling plants is not taken into account.

Since only one scenario is used, the results are shown in the relevant summary table.

B1 Use (Not Declared)

B2 Cleaning, servicing and maintenance (not relevant)

Since only one scenario is used, the results are shown in the relevant summary table.

B2.1 Cleaning

No.	Scenario	Description
B2.1.1	**No cleaning**	**No cleaning required during the use and the service life.**

Ancillary materials, consumables, use of energy and water, material losses and waste as well as transport distances during cleaning are negligible.

.
The results of the following table include the RSL related to one year.

B2.2 Servicing and maintenance

No.	Scenario	Description
B2.2.1	**Normal use and heavy use**	**According to manufacturer:** **No replacements of any components during the 20-year service life.**

*Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.

For updated information refer to the relevant manufacturer instructions for assembly/installation, operation and servicing/maintenance. Annual functional testing, visual inspection, lubricating etc. are not mandatory during the lifetime and the use of product according to the company's description.

Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during repair are negligible.
.

B3 Repair (not relevant)

No.	Scenario	Description
B3	**Normal use and heavy use**	**No repair is required during the use and the service life.**

Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during repair are negligible.

The results include the RSL related to one year.
Since only one scenario is used, the results are shown in the relevant summary table.

B4 Replacement

No	Scenario	Description
B4.1	No replacement	No replacement provided during 50 years.*
B4.2	**Normal use and heavy use**	**Two replacements during the building´s 50-year service life.**

*Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.

According to the BBSR table, it is assumed that two replacements will be necessary the during the 50-year building service life. The results include the RSL related to one year.

For updated information refer to the relevant manufacturer instructions for assembly/installation, operation and servicing/maintenance

Case 1 (B4.1) – no replacement:
Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during replacement are negligible.

Case 2 (B4.2) – replacement
The environmental impacts of the selected scenario result from the product and construction and disposal stages.

EPDM rubber gaskets		EPDM Eco		EPDM Standard		EPDM and CR Specialities	
B4 Exchange / Replacement	**Unit**	B4.1	**B4.2**	B4.1	**B4.2**	B4.1	**B4.2**
Core indicators							
GWP-t	kg CO_2 eq.	0.00	**0.16**	0.00	**0.21**	0.00	**0.27**
GWP-f	kg CO_2 eq.	0.00	**0.16**	0.00	**0.21**	0.00	**0.27**
GWP-b	kg CO_2 eq.	0.00	**3.95E-04**	0.00	**9.43E-04**	0.00	**2.09E-03**
GWP-l	kg CO_2 eq.	0.00	**9.44E-04**	0.00	**7.84E-04**	0.00	**3.09E-04**
ODP	kg CFC-11 eq.	0.00	**2.61E-13**	0.00	**2.89E-13**	0.00	**1.47E-12**
AP	mol H^+ eq.	0.00	**1.09E-04**	0.00	**1.85E-04**	0.00	**4.85E-04**
EP-fw	kg P eq.	0.00	**1.61E-07**	0.00	**1.87E-07**	0.00	**3.62E-07**
EP-m	kg N eq.	0.00	**3.02E-05**	0.00	**3.97E-05**	0.00	**7.81E-05**
EP-t	mol N eq.	0.00	**3.48E-04**	0.00	**4.42E-04**	0.00	**8.74E-04**
POCP	kg NMVOC eq.	0.00	**1.10E-04**	0.00	**1.47E-04**	0.00	**2.55E-04**
ADPF	MJ	0.00	**1.24**	0.00	**2.33**	0.00	**3.10**
ADPE	kg Sb eq.	0.00	**3.73E-08**	0.00	**3.81E-08**	0.00	**2.06E-04**
WDP	m^3 world eq. de-prived	0.00	**1.37E-02**	0.00	**1.29E-02**	0.00	**2.59E-02**
Use of resources							
PERE	MJ	0.00	**0.18**	0.00	**0.19**	0.00	**0.73**
PERM	MJ	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**
PERT	MJ	0.00	**0.18**	0.00	**0.19**	0.00	**0.73**

PENRE	MJ	0.00	**1.20**	0.00	**2.26**	0.00	**3.06**
PENRM	MJ	0.00	**3.81E-02**	0.00	**6.68E-02**	0.00	**3.92E-02**
PENRT	MJ	0.00	**1.24**	0.00	**2.33**	0.00	**3.10**
SM	kg	0.00	**2.03E-03**	0.00	**2.03E-03**	0.00	**2.33E-03**
RSF	MJ	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**
NRSF	MJ	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**
FW	m^3	0.00	**4.27E-04**	0.00	**5.50E-04**	0.00	**1.14E-03**
Waste categories							
HWD	kg	0.00	**3.89E-10**	0.00	**4.49E-10**	0.00	**1.63E-09**
NHWD	kg	0.00	**1.32E-02**	0.00	**6.02E-03**	0.00	**1.26E-02**
RWD	kg	0.00	**2.32E-05**	0.00	**2.52E-05**	0.00	**8.14E-05**
Output material flows							
CRU	kg	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**
MFR	kg	0.00	**1.42E-05**	0.00	**1.42E-05**	0.00	**9.44E-06**
MER	kg	0.00	**0.00**	0.00	**0.00**	0.00	**0.00**
EEE	MJ	0.00	**0.17**	0.00	**0.17**	0.00	**0.18**
EET	MJ	0.00	**0.31**	0.00	**0.31**	0.00	**0.31**
Additional environmental impact indicators							
PM	Disease incidence	0.00	**1.31E-09**	0.00	**3.76E-09**	0.00	**1.70E-08**
IRP	kBq U235 eq.	0.00	**3.25E-03**	0.00	**3.49E-03**	0.00	**9.41E-03**
ETP-fw	CTUe	0.00	**1.08**	0.00	**1.83**	0.00	**2.27**
HTP-c	CTUh	0.00	**1.72E-11**	0.00	**3.01E-11**	0.00	**5.15E-11**
HTP-nc	CTUh	0.00	**4.64E-10**	0.00	**7.20E-10**	0.00	**1.15E-09**
SQP	Dimensionless	0.00	**0.39**	0.00	**0.39**	0.00	**0.60**

B5 Modification/refurbishment (not relevant)

According to the manufacturer, the elements are not included in the improvement / modernisation activities for buildings.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Semperit Profiles

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during replacement are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B6 Operational energy use (not relevant)

No.	Scenario	Description
B6.1	**Hand-operated**	**No energy consumed when used**

* Frequencies, times of use, number of users, cycles, etc.

There is no energy consumption during normal use. The products are used by manual operation.
There is no transport consumption during the energy use in buildings. Ancillary materials, consumables and water, waste materials and other scenarios are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B7 Operational water use (not relevant)

There's no water consumption when used as intended. Water consumption for cleaning is specified in module B2.1.

There is no transport consumption during water use in buildings. Ancillary materials, consumables, waste materials and other scenarios are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

C1 Deconstruction, demolition

No.	Scenario	Description
C1	**Deconstruction**	**Based on EN 17213: 95% of glass-free materials can be recycled and the rest 5% is sent to landfill.**

No relevant inputs or outputs apply to the scenario selected. The energy consumed for deconstruction is 1MJ/kg (according to Semperit Profiles description) and the calculations have been made based on actual consumption.

Since only one scenario is used, the results are shown in the relevant summary table.

In case of deviating consumption, the removal of the products forms part of the site management and is covered at the construction works level.

C2 Transport

No.	Scenario	Description
C2	**Transport**	**Transport to collection point using 34-40 t truck (Euro 0-6 mix), diesel, 27 t payload, 50% capacity used, 100 km***

* *EPDs für transparente Bauelemente - Abschlussbericht.* Rosenheim : ift Rosenheim GmbH, 2011

Since only one scenario is used, the results are shown in the relevant summary table.

C3 Waste management

No.	Scenario	Description
C3	Current market situation	Share for recirculation of materials: • Based on EN 17213: EPDM (other plastics) 100%, thermal recycling in waste incineration plant

Electricity consumption of shredding process is 1 MJ/kg (Semperit Profiles provided information).

As the products are placed on the European market, the disposal scenario is based on average European datasets.

The table below describes the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned proportions in percent related to the declared unit of the product system.

C3 Disposal	Unit	PG1	PG2	PG3
Collection process, collected separately	kg	0.95	0.95	0.95
Collection process, collected as mixed construction waste	kg	0.05	0.05	0.05
Recovery system, for reuse	kg	0.00	0.00	0.00
Recovery system, for recycling	kg	0.00	0.00	0.00
Recovery system, for energy recovery	kg	0.95	0.95	0.95
Disposal	kg	0.05	0.05	0.05

Table 18: Disposal processes by weight for product groups of EPDM rubber gaskets

Since only one scenario is used, the results are shown in the summary table.

C4 Disposal

No.	Scenario	Description
C4	Disposal	**The non-recordable amounts and losses within the re-use/recycling chain (C1 and C3) are modelled as “disposed” (RER).**

The consumption in scenario C4 results from physical pre-treatment, waste recycling and management of the disposal site. The benefits obtained here from the substitution of primary material production are allocated to module D, e.g. electricity and heat from waste incineration.

Since only one scenario is used, the results are shown in the summary table.

D Benefits and loads from beyond the system boundaries

No.	Scenario	Description[1]
D	**Recycling potential (current market situation)**	**Benefits from EPDM seal in waste incineration: electricity replaces electricity mix (RER); thermal energy replaces thermal energy from natural gas (RER).**
The values in module “D” result from recycling of the packaging material in module A5 and from deconstruction at the end of service life. Since only one scenario is used, the results are shown in the summary table.		

10 Annex B

The GWP-t values presented below were determined separately for each product group, applying a distinct factor per 1 kg of product. The applied factors are based on preliminary studies and life cycle assessments conducted for each group.

EPDM Eco				EPDM Standard				EPDM and CR Specialities			
Product	**GWP-t A1-A3 kg CO_2 eq.**	**Product**	**GWP-t A1-A3 kg CO_2 eq.**	**Product**	**GWP-t A1-A3 kg CO_2 eq.**	**Product**	**GWP-t A1-A3 kg CO_2 eq.**	**Product**	**GWP-t A1-A3 kg CO_2 eq.**	**Product**	**GWP-t A1-A3 kg CO_2 eq.**
EPDM Bau 70	2.39	EPDM Moos VPA 2 middle bright	2.03	EPDM 80 KS	3.32	EPDM 70 SV	3.22	EPDM Brand 70 CR	4.91	EPDM 80 MR	3.48
EPDM Bau 60	2.37	EPDM 70 (sawable)	1.87	Foamed Rubber P200	3.29	EPDM 70 MR	3.16	EPDM 80 OK	3.96	EPDM 70 XT	3.36
EPDM 70 black (weldable)	2.03	EPDM Bau 70 (sawable)	1.94	EPDM 70 KS	3.29	EPDM Flame 70	3.12	EPDM 80 XT (2)	3.62	EPDM 50	3.35
EPDM Bau 60 fawn (sawable)	1.97	EPDM Bau 60 silver grey	2.03	EPDM 70 GF	3.29	EPDM 90	3.11	EPDM Bau 80	3.56	EPDM 70	3.40
EPDM Moos VPA 2 hard bright	2.03	Foamed Rubber S HD	2.09	EPDM Bau 50	3.29	EPDM Foamed Rubber S 30	3.00	EPDM 80 XT (1)	3.56		
EPDM Bau 70 grey (weldable)	2.07	EPDM Bau 70 grey (sawable)	1.95	Foamed Rubber P100	3.29	EPDM 60 XT	3.00	EPDM ABF 70 S	3.55		
EPDM Moos VPA 2 soft bright	2.03	EPDM 70 + 30% Reclaimed	2.39	Foamed Rubber P175/P300	3.29	EPDM Foamed Rubber S 120	2.99	EPDM 70 S CoEx	3.53		
EPDM Bau 60 light grey	2.02	EPDM 60 + 30% Reclaimed	2.37	Foamed Rubber P176 XT	3.29	EPDM 60 (1)	2.99	EPDM 70 SV	3.52		
EPDM Bau 60 grey	2.02			EPDM Bau 65 S	3.25	EPDM Foamed Rubber S 70	2.97	EPDM 85 GL	3.51		
EPDM 70 silver grey	1.95			EPDM 60 (2)	3.23			EPDM 60 US	3.50		

Key: GWP-t – global warming potential - total

Imprint

Practitioner of the LCA
ift Hellas P.C.
Palaiokomis
GR-56224, Evosmos-Thessaloniki

Programme operator
ift Rosenheim GmbH
Theodor-Gietl-Str. 7-9
D-83026 Rosenheim
Phone: +49 80 31/261-0
Fax: +49 80 31/261 290
Email: info@ift-rosenheim.de
www.ift-rosenheim.de

Declaration holders
Semperit Profiles Deggendorf GmbH,
Land Au 30,
94469 Deggendorf, Germany

Semperit Profiles Leeser GmbH
Ottostraße 25-27,
41836 Hückelhoven-Baal, Germany

Notes
This EPD is mainly based on the work and findings of the Institut für Fenstertechnik e.V., Rosenheim (ift Rosenheim) and specifically on the “ift-Richtlinie NA-01/5 Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen”. (Guideline NA-01/5 - Guidance on preparing Type III Environmental Product Declarations)

Layout
ift Rosenheim GmbH – 2021

Photographs (front page)
Semperit Profiles

ift Rosenheim GmbH
Theodor-Gietl-Str. 7-9
D-83026 Rosenheim
Phone: +49 (0) 80 31/261-0
Fax: +49 (0) 80 31/261-290
Email: info@ift-rosenheim.de
www.ift-rosenheim.de