alwitra GmbH

Product sustainability fact sheet

Product information for the building certification scheme BREEAM® (Building Research Establishment's Environmental Assessment Method)

The intention of this document is to support the BREEAM certification process by providing product specific information. The basis of this information is BREEAM technical manual (2014)[1].

EPDM waterproofing membrane systems EVALASTIC® V, VG, VGSK

General Information

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Product information

Product description

EVALASTIC® are bitumen compatible waterproofing membrane system made of EPDM. The product consists of a high polymer alloy of ethylene-propylene-diene terpolymer (EPDM) and polypropylene (PP) including additives. The waterproofing membranes are manufactured with a polyester fleece fleece or a glass/polyester fleece backing in a calendaring process. Seam welding is carried out with hot air.

EVALASTIC® V:
EVALASTIC® V membranes are equipped with a polyester fleece backing

EVALASTIC® VG:
EVALASTIC® VG membranes are equipped with a glass/polyester fleece backing

EVALASTIC® VGSK:
EVALASTIC® VGSK membranes are equipped with a glass/polyester fleece backing and a self-adhesive coating incl. protective foil.

[1]BREEAM UK New Construction non-domestic buildings technical manual 2014; Reference: SD5076 – Issue: 1.0; Date: 21/05/2014, www.breeam.org

Application

EVALASTIC® membranes can be applied in one layer for waterproofing of non-used and used flat and low slope roofs. Depending on specification, the membranes are applied as follows:

EVALASTIC® V and EVALASTIC® VG

- loose laid under ballast
- mechanically fastened
- adhesive bonding with system adhesive

EVALASTIC® VGSK

- with its integrated fire retarding layer bonded directly to unbacked EPS insulation boards without any wash primer. They can also be bonded with alwitra wash primer

EVALASTIC® V can also be applied in one layer for waterproofing of non-waterproof foundations or constructional parts against ground moisture and non-pressing water (as a dampproofing system). Depending on specification, the membranes can be applied as follows:

- loose laid under ballast
- bonded

Technical data

Name	Value	Unit
Max. tensile force according to EN 12311-2 (A)	500	N/50mm
Elongation at max. tensile force according to EN 12311-2 (A)	60	%
Peel resistance of the seam joint according to EN 12316-2	150	N/50mm
Shear resistance of the seam joint according to EN12317-2	200	N/50mm
Tear propagation resistance according to EN 12310-1	300	N
Resistance to static load according to EN 12730 (B)	20	kg
Water tightness according to EN 1928	400	kPa
Artificial ageing according to EN 1297	class 0	-
Folding in the cold according to EN 495-5	-40	°C
Bitumen compatibility according to EN 1548	passed	-
Resistance to root penetration (for green roofs) according to EN 13948 or the German guiding principle FLL	passed	-
Ozone resistance (for EPDM/IIR) according to EN 1844	passed	-

Product declarations

Environmental product declaration
An EPD is available - see section Mat 01 – Life cycle impacts

Management

Summary
This category encourages the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare activities to ensure that robust sustainability objectives are set and followed through into the operation of the building. Issues in this section focus on embedding sustainability actions through the key stages of design, procurement and initial occupation from the initial project brief stage to the appropriate provision of aftercare.

Category summary table for this BREEAM issue:

Issue ID	Issue name	Relevance for the declared product
Man 01	Project brief and design	No
Man 02	Life cycle cost and service life planning	Yes
Man 03	Responsible construction practices	No
Man 04	Commissioning and handover	No
Man 05	Aftercare	No

Man 02 Life cycle cost and service life planning

Aim of this issue
To deliver whole life value from investment and promote economic sustainability by recognising and encouraging the use and sharing of life cycle costing and service life planning to improve design, specification and through-life maintenance and operation.

Product information for EVALASTIC® V within this issue:

Specific information	Evidence (quality)
Reference service life RSL	> 35 years If exposed to standard load, professionally installed and applied in accordance with the intended use under normal climatic conditions in compliance with the generally accepted engineering standards, the declared products can reach a service life of 35 years and more. If professionally applied under an ecological protection/wearing layer (e. g. green roof) this service life can be still extended. The in-use conditions will be significantly enhanced when installed with alwitra system parts, as the system parts used in the waterproofing such as rainwater outlets, vents, coated metal sheets or roof lights are flashed against the declared membranes in a homogeneous, waterproof connection. The waterproofing of adjacent constructional elements is complemented by additional components of the product system, e.g. roof edge trim and wall connection profiles. If the waterproofing consists of the declared products, it will not be necessary to remove it in case of restoration/refurbishment. In fact, the old waterproofing usually can serve as a substrate for the new refurbishment layer.
Maintenance requirements/ recommendations	Maintenance should include the following tasks: - Cleaning the surface by removing dirt, leaves and further unwanted vegetation - Cleaning roof drains and ventilation openings - Gravel drift balancing. Maintenance activities should be executed once or twice per year, depending on the roof pitch, as well as related mechanical, thermal, biological, chemical and further environmental characteristics that influence roofing and aging.

End of life stage	EVALASTIC® membranes are not re-used in their original form after their service life. If sorted, EVALASTIC® membranes can be collected by the ROOFCOLLECT® system (Recycling System for Thermoplastic Membranes). The recycled materials gained from the old roofing membranes can be reintroduced into the cycle of materials, e. g. by usage in inspection walkway tiles. These inspection walkway tiles are used to protect the waterproofing and to mark the maintenance walkways on flat roofs. The textured surface provides a strong grip, even on sloped and wet areas. At the end of service life, thermal utilisation is also possible. The energy contained in the declared products is recovered, thus saving on additional back-up firing in the waste incineration plant. The energy of 1 kg of EPDM waterproofing membrane (e. g. EVALASTIC® V with polyester fleece backing) equals the energy of approx. 0.65 litres of fuel oil.

Additionally, the information provided within the EPD can be used within life cycle costing / planning.

Materials

Summary
This category encourages steps taken to reduce the impact of construction materials through design, construction, maintenance and repair. Issues in this section focus on the procurement of materials that are sourced in a responsible way and have a low embodied impact over their life including extraction, processing and manufacture and recycling.

Category summary table for this BREEAM issue:

Issue ID	Issue name	Relevance for the declared product
Mat 01	Life cycle impacts	Yes
Mat 02	Hard landscaping and boundary protection	No
Mat 03	Responsible sourcing of materials	Yes
Mat 04	Insulation	No
Mat 05	Designing for durability and resilience	Yes
Mat 06	Material efficiency	Yes

Mat 01 Life cycle impacts

Aim of this issue
To recognise and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building.

Product information for EVALASTIC® V within this issue:

Description	Value	Link
Product specific environmental profile certification available?	yes (product specific EPD)	
Author of the LCA	thinkstep AG, (formerly PE INTERNATIONAL AG), Leinfelden-Echterdingen, Germany	
EPD Program Operator	Institute Construction and Environment (IBU - Institut Bauen und Umwelt e.V.), Berlin, Germany	www.construction-environment.com

EPD Number	EPD-ALW-20190186-IBAC-DE	https://alwitra.de/wp-content/uploads/2020/03/EPD_EVALASTIC_en_2020.pdf
System boundaries	A1-A5, C2, C3, D (cradle-to-gate with options)	-
PCR	Plastic and elastomer roofing and sealing sheet systems	
Green Guide rating	See generic Green Guide ratings for EPDM single ply roofing membranes at www.bre.co.uk/greenguide	e.g. Green Guide Element: 1212540022 "Precast prestressed concrete hollow slab, with screed, vapour control layer, insulation, EPDM single ply waterproofing membrane" with a **B summary rating**
Scenarios	Scenario 1: 100% waste incineration at a distance of 50 km Scenario 2: 100% recycling (for production of maintenance walkway tiles) at a distance of 737 km	

The declared unit is 1 m² of average produced, installed and disposed of/recycled EVALASTIC® roofing and waterproofing membrane system with a thickness of 1.5 mm. The averaging was based on annual production data (total inputs and outputs per year). The values calculated in this way were scaled to a representative thickness and correspond to approx. 90% market share of the delivered products. The approximate calculation of other thicknesses can be done by the following formula:

$I_{d,new}=(I_{decl}*d_{new})/1,2$, *where*
$I_{d,new}$*: indicator result in relation to a new thickness*
I_{decl}*: indicator result of the respective life cycle phase*
d_{new}*: thickness to be calculated in mm*

The life cycle assessment deviations within the produced product varieties can be classified as low (< 5 %).

Results of the LCA – ENVIRONMENTAL IMPACTS according to EN 15804+A1:

Declared unit: 1 m² of average produced and installed EVALASTIC®									
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS	
	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
GWP [kg CO_2-eq.]	8,61E+00	3,31E-02	6,25E-01	4,53E-03	6,68E-02	5,26E+00	8,25E-01	-3,18E+00	-5,67E+00
ODP [kg CFC11-eq.]	6,09E-13	1,13E-17	3,08E-14	1,54E-18	2,28E-17	3,63E-15	3,18E-14	-6,62E-14	-6,93E-14
AP [kg SO_2-eq.]	2,09E-02	6,85E-05	1,08E-03	9,38E-06	1,38E-04	1,36E-03	1,31E-03	-3,35E-03	-1,34E-02
EP [kg PO_4^{3-}- eq.]	2,14E-03	1,70E-05	1,15E-04	2,33E-06	3,44E-05	1,32E-04	2,25E-04	-5,67E-04	-1,37E-03
POCP [kg ethene-eq.]	1,76E-03	-2,35E-05	8,89E-05	-3,22E-06	-4,75E-05	5,55E-05	3,00E-05	-2,89E-04	-1,13E-03
ADPE [kg Sb eq.]	2,37E-04	3,12E-09	1,19E-05	4,27E-10	6,30E-09	7,78E-07	3,23E-07	-7,47E-07	-1,52E-04
ADPF [MJ]	1,74E+02	4,41E-01	8,77E+00	6,04E-02	8,90E-01	2,20E+00	8,28E+00	-4,14E+01	-1,12E+02
Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation Potential; ADPE = Abiotic depletion potential for non-fossil resources (ADP - substances); ADPF = Abiotic depletion potential for fossil fuels (ADP - fossil energy sources)								

Results of the LCA – RESOURCE USE according to EN 15804+A1:

Declared unit: 1 m² of average produced and installed EVALASTIC®									
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS	
	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/1	D/1	D/2
PE total [MJ]	2,13E+02	4,69E-01	1,08E+01	6,43E-02	9,47E-01	3,08E+00	1,59E+01	-5,72E+01	-1,36E+02
PERE [MJ]	2,56E+01	2,69E-02	2,69E+00	3,69E-03	5,44E-02	6,14E-01	5,29E+00	-1,09E+01	-1,63E+01
PERM [MJ]	1,29E+00	0,00E+00	-1,29E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [MJ]	2,69E+01	2,69E-02	1,40E+00	3,69E-03	5,44E-02	6,14E-01	5,29E+00	-1,09E+01	-1,63E+01
PENRE [MJ]	1,10E+02	4,42E-01	9,73E+00	6,06E-02	8,93E-01	7,82E+01	1,06E+01	-4,63E+01	-1,20E+02
PENRM [MJ]	7,61E+01	0,00E+00	-3,03E-01	0,00E+00	0,00E+00	-7,58E+01	0,00E+00	0,00E+00	0,00E+00
PENRT [MJ]	1,86E+02	4,42E-01	9,43E+00	6,06E-02	8,93E-01	2,47E+00	1,06E+01	-4,63E+01	-1,20E+02
SM [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW [m³]	4,20E-02	3,09E-05	2,60E-03	4,23E-06	6,23E-05	1,29E-02	2,88E-03	-5,92E-03	-2,70E-02
Caption	PE total = Total use of primary energy resources (=PERT+PENRT)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 – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1:

Declared unit: 1 m² of average produced and installed EVALASTIC®									
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS	
	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
GWP [kg CO_2-eq.]	5,39E-07	2,52E-08	2,83E-08	3,45E-09	5,09E-08	1,36E-08	5,84E-08	-2,60E-08	-3,36E-07
ODP [kg CFC11-eq.]	7,56E-01	2,97E-05	3,98E-02	4,07E-06	6,00E-05	5,50E-01	1,01E-02	-2,43E-02	-4,86E-01
AP [kg SO_2-eq.]	5,02E-03	5,26E-07	2,60E-04	7,20E-08	1,06E-06	1,05E-04	9,14E-04	-1,91E-03	-3,25E-03
EP [kg PO_4^{3-}- eq.]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP [kg ethene-eq.]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,96E+00	0,00E+00	0,00E+00
ADPE [kg Sb eq.]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,96E+00	0,00E+00	0,00E+00	0,00E+00
ADPF [MJ]	0,00E+00	0,00E+00	2,45E-01	0,00E+00	0,00E+00	9,80E+00	0,00E+00	0,00E+00	0,00E+00
Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation Potential; ADPE = Abiotic depletion potential for non-fossil resources (ADP - substances); ADPF = Abiotic depletion potential for fossil fuels (ADP - fossil energy sources)								

Mat 03 Responsible sourcing of materials

Aim of this issue
To recognise and encourage the specification and procurement of responsibly sourced materials for key building elements.

Product information for EVALASTIC® within this issue:

Responsible Sourcing Certification Scheme	Certification level / scope
ISO 9001: 2015	The quality management system of alwitra GmbH has been certified according to ISO 9001. The certificate is available online, see https://alwitra.de/wp-content/uploads/2019/01/Zertifikat-ISO-9001_2015-englisch.pdf The suppliers of the most important raw materials (regarding mass contribution) are also certified according to ISO 9001.
ISO 14001: 2015	The environmental management system of alwitra GmbH has been certified according to ISO 14001. The certificate is available online, see https://alwitra.de/wp-content/uploads/2019/01/Zertifikat-ISO-14001_2015-englisch.pdf The suppliers of the most important raw materials (regarding mass contribution) are also certified according to ISO 14001.
ISO 50001: 2011	The energy management system of alwitra GmbH & has been certified according to ISO 50001. The certificate is available online, see hhttps://alwitra.de/wp-content/uploads/2019/01/Zertifikat-ISO-50001_2011-englisch.pdf .

Responsible sourcing certification scheme point scores
A graded scale to reflect the rigour of the certification scheme used to demonstrate responsible sourcing, forming the basis for awarding credits in the BREEAM issue Mat 03. Refer to Guidance Note (TBC) available in the Resources section of the BREEAM website for an up-to-date table of responsible sourcing certification schemes recognised by BRE Global Ltd for the purposes of a BREEAM assessment.

Detailed information Mat 03 Responsible sourcing of materials and http://www.breeam.org/page.jsp?id=617

Mat 05 Designing for durability and resilience

Aim of this issue
To recognise and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials optimisation.

Product information for EVALASTIC® V within this issue:

Item	Description	Evidence (quality)
Durability improvement	The roofing membranes are designed to last more than 35 years.	See above in “Man 02” the description of the product.

Mat 06 Material efficiency

Aim of this issue
To recognise and encourage measures to optimise material efficiency in order to minimise environmental impact of material use and waste.

Product information for EVALASTIC® V within this issue:

Specific information
The product is delivered at standard width and is cut during installation in a way that there are no significant material losses. Offcuts during production are internally recycled to 100 % to achieve a high material efficiency. Using it for a green roof, the membrane provides both waterproofing and root protection in a single product.

Pollution

Summary
This category addresses the prevention and control of pollution and surface water run-off associated with the building's location and use. Issues in this section aim to reduce the buildings impact on surrounding communities and environments arising from light-pollution, noise, flooding and emissions to air, land and water.

Category summary table for this BREEAM issue:

Issue ID	Issue name	Relevance for the declared product
Pol 01	Impact of refrigerants	No
Pol 02	NO_x emissions	No
Pol 03	Surface water run-off	Yes
Pol 04	Reduction of night time light pollution	No
Pol 05	Reduction of noise pollution	No

Pol 03 Surface water run-off

Aim of this issue
To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, thereby minimising the risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage.

Product information for EVALASTIC® within this issue:

A green roof reduces the speed and amount of water run-off. EVALASTIC® is resistant to root/rhizome penetration and can therefore be used for green roofs as a waterproofing membrane providing a protection against root penetration at the same time.

Waste

Summary
This category encourages the sustainable management (and reuse where feasible) of construction, operational waste and waste through future maintenance and repairs associated with the building structure. By encouraging good design and construction practices, issues in this section aim to reduce the waste arising from the construction and operation of the building, encouraging its diversion from landfill. It includes recognition of measures to reduce future waste as a result of the need to alter the building in the light of future changes to climate.

Category summary table for this BREEAM issue:

Issue ID	Issue name	Relevance for the declared product
Wst 01	Construction waste management	Yes
Wst 02	Recycled aggregates	No
Wst 03	Operational waste	No
Wst 04	Speculative floor and ceiling finishes	No
Wst 05	Adaptation to climate change	No
Wst 06	Functional adaptability	No

Wst 01 Construction waste management

Aim of this issue
To promote resource efficiency via the effective management and reduction of construction waste.

Product information for the declared product within this issue:

Specific information
After the use phase, the membranes are collected and recycled within the ROOFCOLLECT® Recycling System for Thermoplastic Membranes. When repair activities are required, it is generally possible to rebuild the sealing function (waterproofing) made of EVALASTIC® membranes. Therefore, new EVALASTIC® strips are used and fitted by welding techniques according to the manufacturer´s guidelines/installation manual.

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