

EVALON®
Waterproofing Membranes
Installation Manual

for waterproofing of buildings
according to DIN 18533
Waterproofing of elements in
contact with soil



Installation manual for EVALON® waterproofing membranes for sealing against non-pressing water on soil-covered decks according to DIN 18533

General information:

This additional installation manual, together with the current **EVALON® waterproofing membrane installation manual** represents the technical basis with regard to waterproofing of elements in contact with soil.

Principally, for design and execution, consideration is to be given to the following parts of standards.

DIN 18533-2:2017-07, waterproofing of elements in contact with soil –
Part 1: Requirements, design and execution principles

DIN 18533-2:2017-07, waterproofing of elements in contact with soil –
Part 2: Waterproofing with waterproofing materials in sheet form

For the waterproofing of elements in contact with soil, EVA membranes should be used according to the requirements of the European product standard DIN SPEC 20000-202 (application type “BA” - waterproofing of buildings). EVALON® waterproofing membranes meet these requirements.

This installation manual contains basic rules and serves as a guideline for the waterproofing of buildings with EVALON® waterproofing membranes for new build and refurbishment. It represents the manufacturer’s instructions and guidelines for installers and construction site managers. Other local conditions as well as different material combinations not indicated or described in this installation manual may affect functionality. Consequently, an adequate range of tests needs to be carried out.

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Adherence to the relevant national technical rules, as published in standards and regulations, as well as to the workers protection and safety regulations is obligatory. Depending on the country/ continent, material combinations / material thicknesses other than described in this installation manual can be applied according to the relevant national approval.

Written consent by alwitra is required for installations or material combinations deviating from this installation manual or national approvals due to local conditions, otherwise we shall not be liable for the suitability/ appropriateness of our waterproofing membranes including accessories for the applications described. The handling instructions and notes on container labels and safety data sheets for alwitra adhesives and auxiliary materials are to be observed.

Drawings included in this manual are not true to scale and are schematic.

As of January 2022.

Technical changes reserved

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1. Area of application

The following installation manual details the waterproofing of various areas with EVALON® waterproofing membranes. Special conditions or situations not indicated hereunder need to be agreed with the alwitra Technical Department or the alwitra Product Management Department.

This installation manual applies to waterproofing against non-pressing water on soil-covered decks.

2. Waterproofing of elements in contact with soil

2.1 Water action classes

N°	1	2
	Class	Type of action
1	W1-E	Soil moisture and non-pressing water
2	W1.1-E	Soil moisture and non-pressing water with base plates and walls in contact with soil
3	W1.2-E	Soil moisture and non-pressing water with base plates and walls in contact with soil with drainage
4	W2-E	Pressing water
5	W2.1-E	Moderate action of pressing water ≤ 3 m immersion depth
6	W2.2-E	High action of pressing water > 3 m immersion depth
7	W3-E	Non-pressing water on soil-covered decks
8	W4-E	Splash and soil moisture at the wall base as well as capillary water in and under walls

For waterproofings against non-pressing water on soil-covered decks water action class **W3-E** applies.

The water accumulation height must not exceed 10 cm. Otherwise, water action class **W2-E** needs to be applied.

2.2 Crack classes

The waterproofing layer must be suitable for bridging expected cracks in the substrate or changes in crack width.

Requirements to be considered for:

- crack classes **R1-E** ≤ 0.2 mm (crack formation / changes in crack width)
- crack classes **R2-E** ≤ 0.5 mm (crack formation / changes in crack width)

2.3 Crack bridging classes

The waterproofing types as of DIN 18533 are assigned to crack bridging classes according to the defined crack classes (see above).

The water action class **W3-E** is assigned min. the crack bridging class **RÜ3-E** (RÜ3-E = high crack bridging ≤ 1.0 mm, with a crack offset ≤ 0.5 mm)

2.4 Space utilisation classes

Space utilisation classes are used to define the various requirements as regards air dryness in rooms waterproofed against soil moisture as well as reliability of the waterproofing type.

RN1-E (low requirements, e.g. open workshop or storage, underground car park)

RN2-E (standard requirements, e.g. common rooms, cellars and storage rooms in standard residential and commercial buildings)

RN3-E (high requirements, e.g. host system room, storeroom for irreplaceable objects of cultural value)

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3. Materials

3.1 Waterproofing materials and their application

The type of waterproofing is selected depending on the following criteria:

- water action class
- crack class
- crack bridging class
- space utilisation class

For the waterproofing of soil-covered decks **1.5 mm** thick EVALON® waterproofing membranes (EVALON® V / VSK) should be selected.

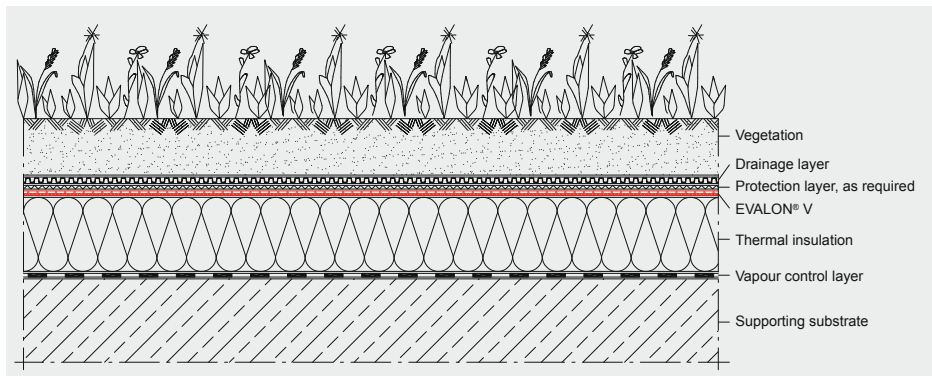
3.1.1 Loose laying

Waterproofing membranes **EVALON® V** are loose laid on a protection layer.

Protection layer consisting of:

- synthetic fibre fleece or artificial fibre geotextiles $\geq 300 \text{ g/m}^2$ or
- bituminous sheets or polymer bituminous sheets according to DIN 18533-2 or
- pressure-resistant thermal insulation (DAA dh or DAA ds)

Application / sealing of seams is carried out according to the installation manual for EVALON® waterproofing membranes.



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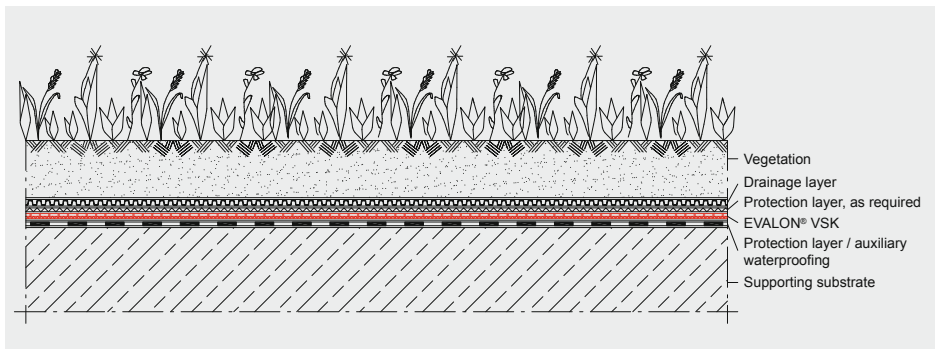
3.1.2 Bonded application

Waterproofing membranes **EVALON® V** can be applied by adhesive bonding as described below:

- a) bonding with system adhesive L 40 on bituminous sheets or polymer bituminous sheets according to DIN 18533-2
- b) by means of torching on a fully welded bituminous welding sheet according to DIN SPEC 20000-202, table 1 line 5, 8, 11, 12 or 15

EVALON® VSK waterproofing membranes, self-adhesive, in connection with alwitra primer SK or SK-L on suitable bituminous or polymer bituminous sheets according to DIN 18533-2.

Application / sealing of seams is carried out according to the installation manual for EVALON® waterproofing membranes.



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3.1.3 Seam testing methods

According to DIN 18534-2 seams and butt joints carried out on site must be tested for integrity. A combination of at least 2 testing methods is to be used.

Mechanical testing (using the alwitra seam checker) should therefore be combined with visual testing (visual seam check).¹



4. Flashings

Flashings are carried out with cut-to-size EVALON® tapes or EVALON® VSKA.

Before carrying out flashings / forming of details in combination with a suitable liquid plastic it is necessary to check possible material combinations (material compatibility).

4.1 Flashings - general information

Water ingress at the upper end of the waterproofing layer, e.g. at the wall base must be prevented. Upstands need to be designed with no or minimum water impact on the membrane edge and with the raised end of the waterproofing (edge) protected against mechanical damage.

The edge waterproofing of the base (parapet) of soil-covered decks should be carried out with the same waterproofing material as used for the main area.

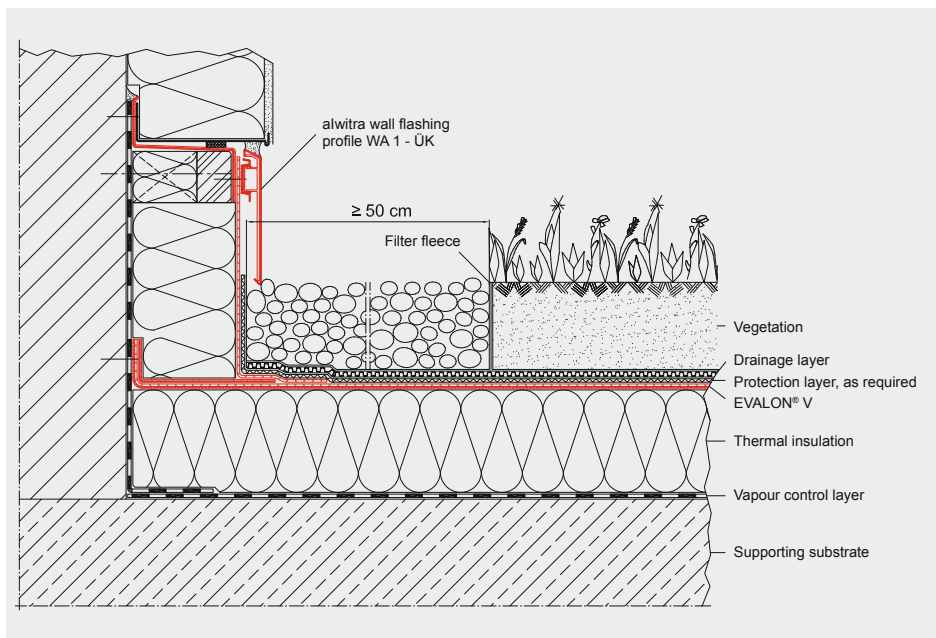
¹ Tip: Set up a test report for the seam and butt joint check

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4.2 Edges with sheathing

If edges are protected against water action by a sheathing and secured against sliding off by a cover or adhesive bond, no additional integrated details are required. Sheathings (e.g. faced brickwork, composite thermal insulation system) need to be fixed without perforating the waterproofing in the area exposed to water action. If perforation is inevitable, the fixing anchors must be sealed.

The upper edge (flashing) must finally be at least 15 cm above the waterproofing level or the upper edge of the paving / vegetation layer.



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4.3 Penetrations

Flashings against integrated details and penetrations are to be carried out either with a corresponding welding flange (integrated PVC detail) and cut-to-size EVALON® tapes or EVALON® sleeves or with a loose / fixed flange construction (EVALON® unbacked). At non-covered penetrations, the waterproofing needs to be secured at the upper edge. At round penetrations, clamps are used to prevent sliding off and water ingress. Clamps must be made of corrosion-resistant metal and be retightenable. If required for installation, they may consist of several parts. The contact surfaces must be at least 25 mm wide. The contact pressure must not lead to compression of the EVALON® waterproofing.

5. Waterproofing of movement joints

For design and execution, provisions of DIN 18533-1, section 11 are to be observed. The position, form and line of movement joints as well as the extent and direction of the movements are determined by impacts arising from the subsoil, construction sequence, ambient conditions, the building and its components themselves as well as its usage. They need to be considered as early as in the design phase.

The position and type of movement joints as well as the expected extent and direction of movements must be indicated and taken into account when designing the waterproofing. Formation of joints in the building structure needs to be aligned with the sealing of joints.

Depending on the type of movement, you will have to differentiate between type I and type II joints. Type I joints are joints for slow and single or rare movements, e.g. settling movements or linear expansions due to seasonal temperature changes.

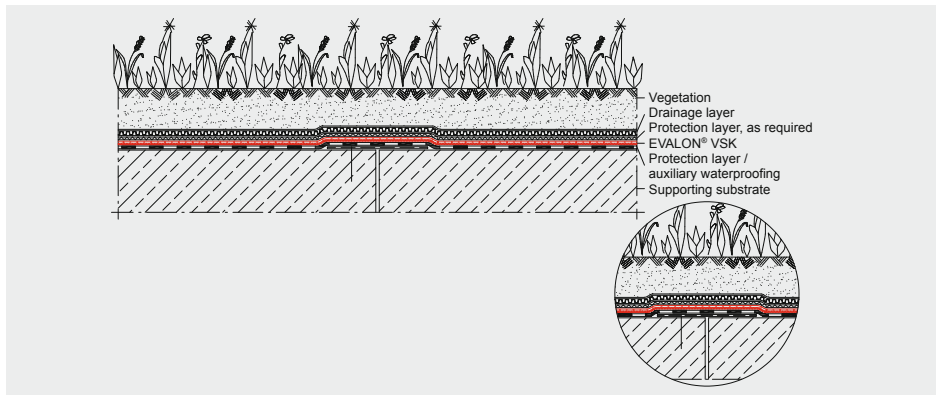
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Type II joints are joints for quick or repeated movements, e.g. movements due to changing traffic load (pay loads according to DIN EN 1991-1-1/NA) or linear expansions due to daily temperature changes.

5.1 Joint type 1 W3-E

For the covering of joints, the waterproofing membranes are installed flat over the joints in accordance with the relevant deformation class (VK).

Deformation class	Supporting metal sheet or joint tape
VK1-E	not required
VK2-E to VK5-E	required



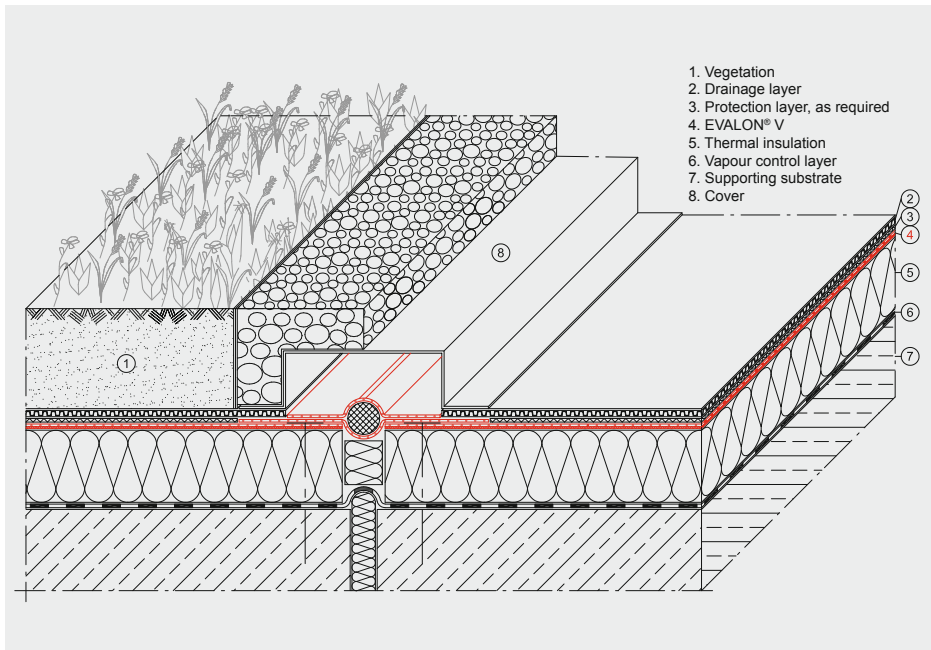
Example: Execution for VK2-E to VK5-E

In case of loose laying, the EVALON® waterproofing can be installed flat in a single ply over the joint, provided the membranes are supported in the joint area. In case of bonded laying, at the joint area the membranes must be left unbonded using appropriate measures (e.g. sliding strips).

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5.2 Joint type II for W3-E

The type of sealing is to be determined individually, taking into consideration the extent and frequency of joint movements as well as the water action, e.g. by discontinuing the area waterproofing and loop-like arrangement of corresponding waterproofing materials or placement of joint tapes, by using prefabricated joint constructions with integrated synthetic or elastomer profiles or by using loose / fixed flange constructions and installing joint tapes. Joint sealings are to be protected from damage by appropriate safeguards (e.g. inspection chamber).



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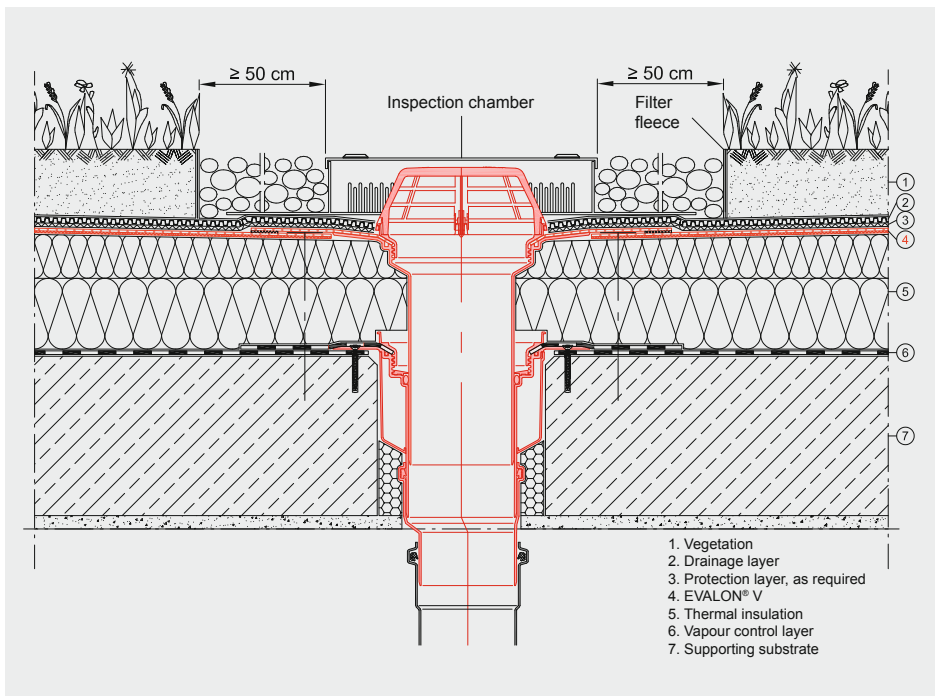
6. Drainage

The drainage of soil-covered decks has to be designed and executed according to DIN EN 12056-3 and DIN 1986-100. It can be carried out as internal drainage with rainwater outlets or as external drainage with discharge into the soil.

6.1 Rainwater outlets

Rainwater outlets have to be designed and installed to provide access for maintenance. Inspection chambers need to be installed over waterproofed outlets. The chamber height is to be aligned with the height of the construction.

Waterproofing of the alwitra rainwater outlets is carried out according to the installation manual for EVALON® waterproofing membranes. Waterproofing of rainwater outlets is also possible with loose / fixed flange constructions.



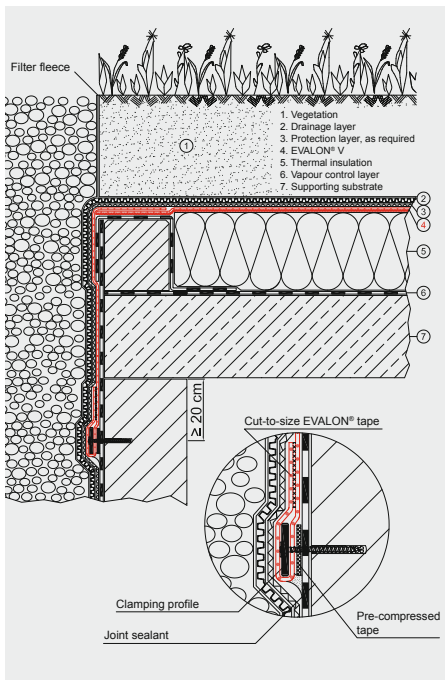
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6.2 Drainage of soil-covered deck areas

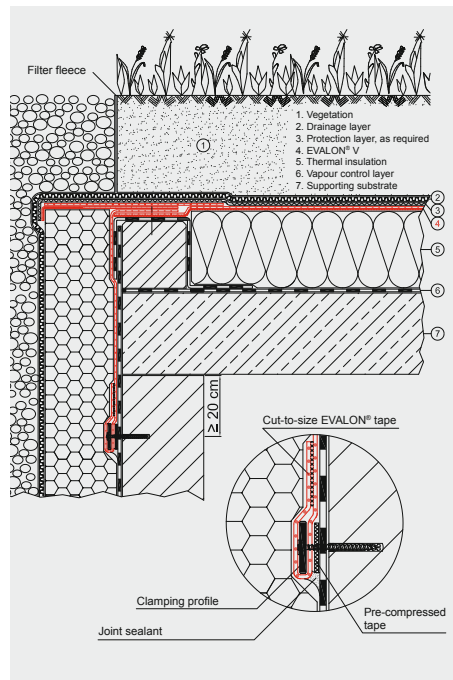
If a drainage of soil-covered deck areas is installed for discharging water, it must meet the requirements of DIN 4095. If water is to be discharged from the deck area directly into the adjacent soil, drainage must be considered also at vertical walls.

Transition from horizontal waterproofing (soil-covered deck) to vertical waterproofing (wall waterproofing).

Example without thermal insulation at vertical area



Example with thermal insulation at vertical area



7. Waterproofing protection

The waterproofing must be protected by a protection coating, protection layer or safeguards. The materials used for this purpose must be compatible with the waterproofing² and resistant to mechanical, thermal and chemical impacts.

Protection layers or coatings on top of the waterproofing should be installed immediately after completion.

Safeguards serve as a temporary protection of the waterproofing during construction works. They have to be designed to the duration of the relevant state of construction, e.g. suspension of works. No loads, e.g. building materials or machines, must be stored on unprotected waterproofing.

During the construction phase, membrane flashings need to be protected from damage by applying appropriate measures.

² E.g. building protection mats „Kraitec® top plus“, Kraiburg, Salzwedel, Germany.

Use of other building-protection mats may lead to slight staining and embossing at the surface of the waterproofing membranes. The manufacturer's installation manual must be adhered to! For other products (drainage mats, dimpled sheets with integrated anti-slip, protective and load distribution layer), compatibility of the material combination with the waterproofing must be agreed with the corresponding manufacturer.



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