

# TECHNICAL BROCHURE

Roof Greening.

**FLAG** YOUR ROOFING AND WATERPROOFING PARTNER

**OPTIGREEN<sup>®</sup>**  
ROOF GREENING



# Optigreen "Economy Roof" System Solution.

## Special features

- ...❖ Especially cost effective roof greening.
- ...❖ Low maintenance green roof design.
- ...❖ Relatively low biodiversity.

## Technical data

|                        |   |
|------------------------|---|
| Weight:                | 80-130 kg/m <sup>2</sup> or 0.8-1.3 KN/m <sup>2</sup> * |
| Layer height:          | 70 mm   |
| Roof pitch:            | 0-5° (0-9 %)  |
| Vegetation form:       | Sedum/herbs/grasses                                     |
| Water retention:       | 50 – 60 %   |
| Discharge coefficient: | 0.5 – 0.4   |
| Water storage:         | ca. 25 l/m <sup>2</sup>                                 |
| Ecological value:      | ■ ■ □ □ □   |
| Maintenance and care:  | ■ □ □ □ □   |
| Cost factor:           | ■ □ □ □ □   |



## Brief description

### ...❖ Solution 1: 0-5°

#### Supply and install...

- ... m<sup>2</sup> Optigreen protection and storage mat type RMS 300/500\*\* as a protective layer on the root-resistant roof membrane
- ... m<sup>2</sup> Optigreen drainage system type FKD 25 as a drainage layer
- ... pcs. Optigreen inspection chamber fitted over the roof outlets
- ... m<sup>2</sup> Optigreen single layer substrate type M. Volume: 60 litres/m<sup>2</sup>
- ... m<sup>2</sup> Optigreen seeding with Optigreen seeds type A and 8 litres/m<sup>2</sup> Optigreen germinating substrate for rapid and safe establishment of vegetation with 50 g sedum shoots
- ... maintenance care

### ...❖ Solution 2: 1-5°

#### Supply and install...

- ... m<sup>2</sup> Optigreen protection and storage mat type RMS 300/500\*\* as a protective layer on the root-resistant roof membrane
- ... pcs. Optigreen Triangle water conduit system consisting of 1 inspection chamber and 24 l/m water conduit profiles per roof outlet
- ... m<sup>2</sup> 70 mm Optigreen extensive single layer substrate type M as drainage and vegetation bearing layer
- ... m<sup>2</sup> Optigreen seeding with Optigreen seeds type A and 8 litres/m<sup>2</sup> Optigreen germinating substrate for rapid and safe establishment of vegetation with 50 g sedum shoots
- ... maintenance care

\* Weight details relate to water-saturated conditions; weight when dry is equal to ca. 60-70 % of weight when wet.

\*\* Pursuant to national directives.



## 1. General principles

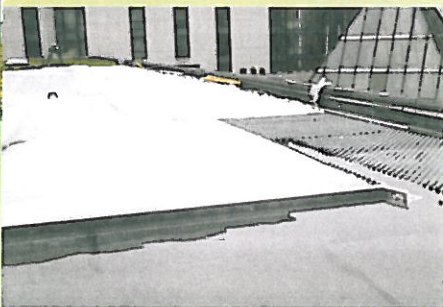
### Why "Economy Roof"?

- Cost effective roof greening with regard to materials, installation and maintenance.
- Relatively low maximum weight. Weighs as little as a ballasted roof. Only the Optigreen "Lightweight Roof" system solution weighs even less.
- Simple but effective method to give even large roof areas a low-maintenance green roof.
- Often cheaper than a ballasted roof.
- Biodiversity is lower than that of the Optigreen "Nature Roof" system solution (see page 14) due to a shallow layer construction and the use of a single-layer substrate.

## 2. 0° roof with ponding



Moss growth due to standing water



Drainage board for standing water:  
FKD 25 for up to 15 mm/FKD 40 for up to 25 mm/FKD 60 for up to 40 mm standing water

### What to do with a non-pitched roof (0 degrees) and standing water?

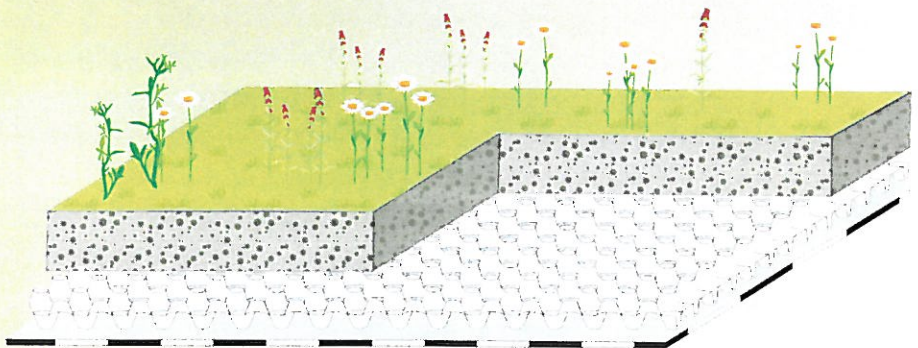
Rainwater that accumulates on a 0° roof due to unevenness and counter slopes and forms ponding of 10-40 mm in depth calls for specific measures to prevent the vegetation from becoming waterlogged.

Single layer extensive greening does not cope well with higher levels of standing water over longer periods of time – the substrate becomes waterlogged, transforming the vegetation from the desired sedum/herb mix to one of moss and grass; this requires significantly more maintenance and has a long lasting negative impact on the roof greening.

### The solution for standing water:

Optigreen "Economy Roof" system with an Optigreen drainage system type FKD 25. The hollow spaces in the Optigreen drainage system type FKD 25 fulfil two purposes: on the one hand, they direct some of the excess water to the drainage outlet, and on the other they retain the remaining standing water from the Optigreen extensive single layer substrate type M.

→ Alternative solution: Optigreen nature roof in a three-layer build-up (see Page 14).



## Brief product description

### Optigreen hydro-seeding (alternative: dry seeding)

Seeding method with a special germinating substrate and a balanced seed mix consisting of many different herbs, a number of grasses and various types of sedum shoots

### Optigreen extensive single layer substrate type M (70 mm)

This substrate is specifically for extensive single layer substrate with high water retention capacity and good drainage

### Optigreen drainage system type FKD 25 (25 mm)

- Rapid discharge of surplus water
- Prevents the accumulation of water on non-pitched roofs and in large drainage lengths
- light build-up with high drainage capacity

### Optigreen Triangle water conduit system (patented)

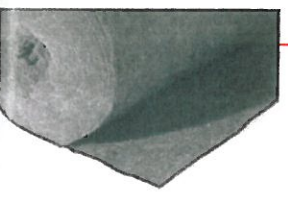
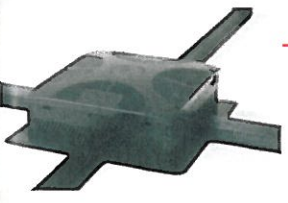
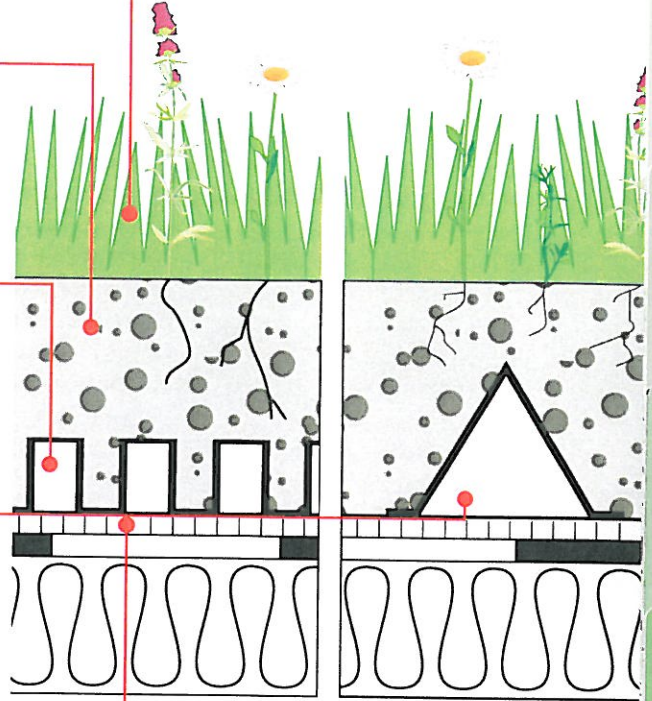
- For rapid water drainage and distribution; consists of inspection chamber and water conduit profiles
- more space for vegetation roots

### Optigreen protection and storage mat type RMS 300/500\*\*

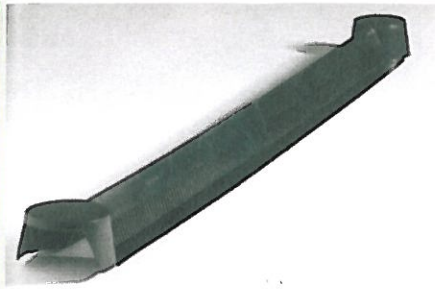
Protects the roof membrane against damage and stores water

**Solution 1: 0-5°**

**Solution 2: 1-5°**



### 3. Pitched roof

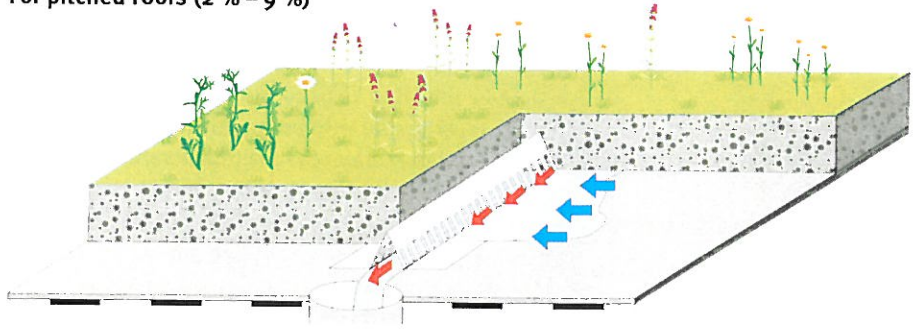


Triangle water conduit profile



Triangle water conduit profiles as "incision channels"

For pitched roofs (2 % – 9 %)



Heavy rainfall (300 l/s x ha) can cause waterlogging on roofs with a minimum pitch if drainage over longer distances (around 10 m) is insufficiently dimensioned. As a rule, excess water should always be directed to the roof outlets without the formation of backwater. This is achieved by installing a drainage network consisting of 24 m of triangle water conduits profiles per roof outlet and the matching inspection chamber. Optigreen Triangle water conduit profiles are laid out on the Optigreen protection fleece in a Y-formation and covered with Optigreen extensive single layer substrate type M.

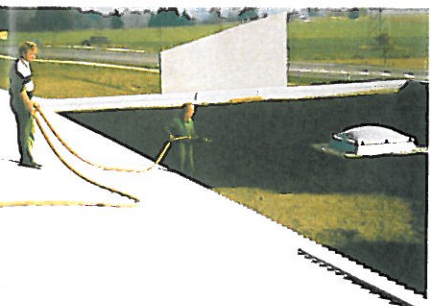
Excess water passes through the Triangle water conduit system to the roof outlets or drainage gutters. Combining an Optigreen Triangle water conduit system with extensive single layer substrate type M will allow for trouble-free flow distances of up to 30 m without any backwater formation.

→ For further details please look under Product Solution Drainage on page 77. The advantage over drainage boards is the greater cost effectiveness of the build-up and a higher vegetation biodiversity due to more space for plant roots.

### 4. Hydroseeding



Distributing sedum shoots



Hydroseeding

#### Reliable application of vegetation through Optigreen hydro-seeding

There is an ideal solution for green roofing large surface areas (from 1,000 m<sup>2</sup>) reliably and cost effectively – Optigreen hydroseeding. Sedum shoots are applied to Optigreen extensive single layer substrate type M (ca. 50 g/m<sup>2</sup>) and covered with a organic watery solution (ca. 8 l/m<sup>2</sup>).

See also page 66. The solution consists of:

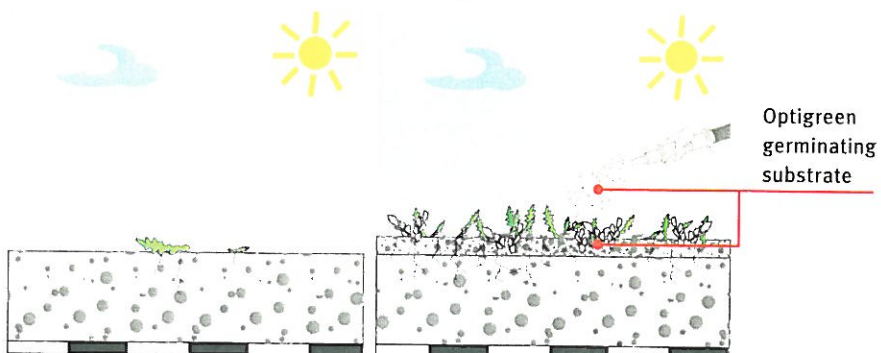
- **Optigreen germinating substrate:** special substrate of mainly organic composition for the rapid establishment of vegetation.
- **Optigreen seeds type A:** a proven, special blend of seeds (sedum/herbs/grasses) for extensive single layer greening.
- **Optigreen erosion protection:** protects against erosion through wind and rain and remains effective for many weeks.

#### → Water

A viscous hydroseeding solution surrounds the sedum shoots and creates a close contact between the plant components and the Optigreen extensive single layer substrate type M. The result is an even distribution of the seeds and shoots over the entire surface area. Optigreen hydroseeding leads to significantly better results with regard to weather independency and is more reliable than dry seeding without Optigreen germinating substrate and erosion protection.

without germinating substrate –  
Hazard of dry damage

with germinating substrate –  
reliable growth

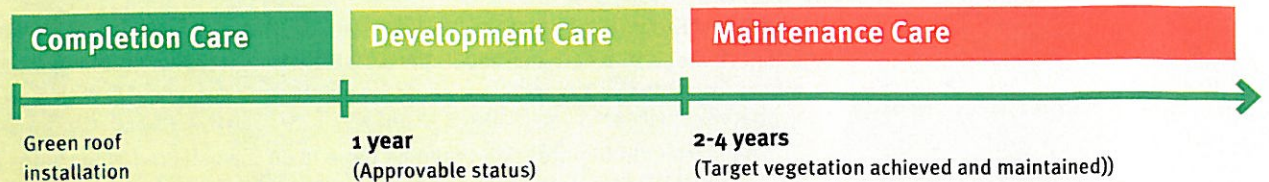


# Optigreen "Care and Maintenance" Product Solution.

Nothing grows without care – this also holds true for greened roofs. Even an un-greened ballast roof should be maintained once a year. It is not any different for green roofs! The German FLL green roofing guidelines and Austrian ONR 121131 address the maintenance and care of green roofs, among other issues.

## 1. Care phases

Green roof care is divided into three phases:



### 1. Completion care

This is part of green roof installation and continues until final approval under a defined "approvable condition" (see page 66/67). Plant coverage is approximately 60 % and therefore not fully complete. Duration: ca. 12-15 months.

### 2. Development care

Follows on from completion care until target vegetation coverage has reached ca. 90 %. Duration: ca. 2-4 years.

### 3. Maintenance care

The target vegetation should be maintained once it is complete.

The care maintenance measures are basically the same in all phases of care. They differ in need according to the development of the greening and in the intensity of the measures described below. As a rule, roofs with extensive greening require maintenance 1-2 times per year and intensive greening 3-10 times per year. Optigreen partner companies maintain a care protocol as proof of the work and measures undertaken.

## 2. Measures



Removal of undesired foreign growth.



Keeping the drainage shaft clear.



Keeping the safety and fire access lanes clear

The following care and maintenance measures should be carried out as needed for both extensive and intensive roof greening:

- Watering (mainly during the growth phase).
- Removal of undesired growth.
- Mowing as and when required.
- Fertilizing with Opticote long term fertilizer.
- Removal of cuttings, leaves and refuse.
- Re-seeding or re-planting of bad spots, re-filling substrate.
- Plant protection.
- Keeping borders, safety strips and paved areas clear.
- Cleaning gutters, control shafts, roof outlets, etc.

Intensive greening can also require the following additional work:

- Cutting.
- Mulching.
- Winter protection measures.
- Correction and/or removal of anchors for bushes.
- For accessible lawn surfaces: de-thatching, aerating, sand filling.
- Maintenance of watering facilities.

For extensive greening: About 1-2 times in a year. As agreed with your Optigreen Partner.

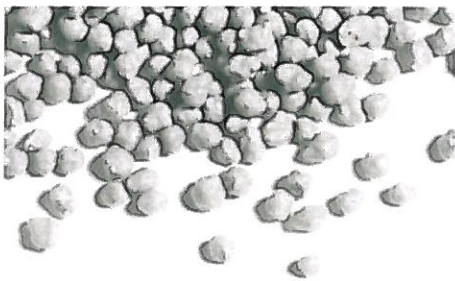
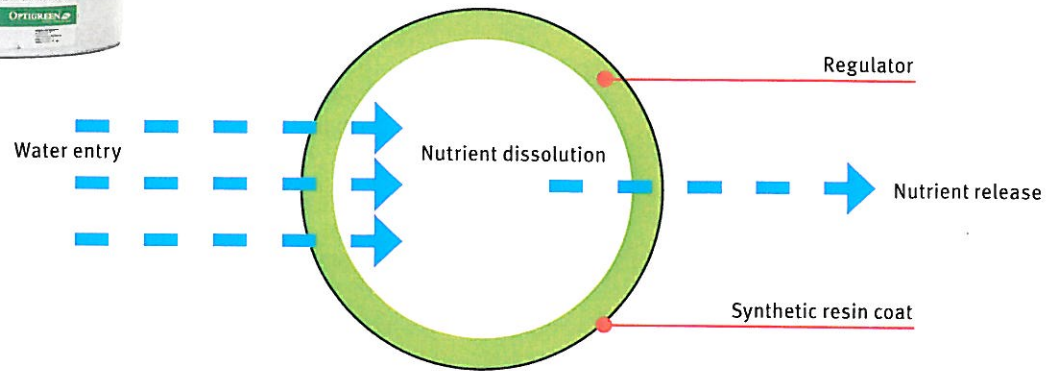
For intensive greening: about 3-10 times in a year. As agreed with your Optigreen Partner.

### 3. Optigreen Opticote long term fertilizer



Opticote is a fully coated long term fertilizer with an effective period of around 8-9 months. The length of the effective period is dependent on temperature. Nutrient release occurs according to the principle of diffusion and is controlled by the regulator in the fertilizer coat.

**Opticote works when the plant needs nutrients – with sufficient moisture and higher temperatures. No nutrients are washed out.**



#### Advantages of Opticote

- Uniform nutrient supply over the entire growth period.
- No over fertilization thanks to the full coating of the fertilizer.
- Slow delivery prevents nutrients from being washed out into the drainage system.

#### Opticote composition:

|   |      |
|---|------|
| Nitrogen N                              | 18 % |
| Phosphate P <sub>2</sub> O <sub>2</sub> | 6 %  |
| Potassium oxide K <sub>2</sub> O        | 8 %  |
| Magnesium oxide MgO                     | 2 %  |

#### Required applications for Optigreen green roofs [per year]:

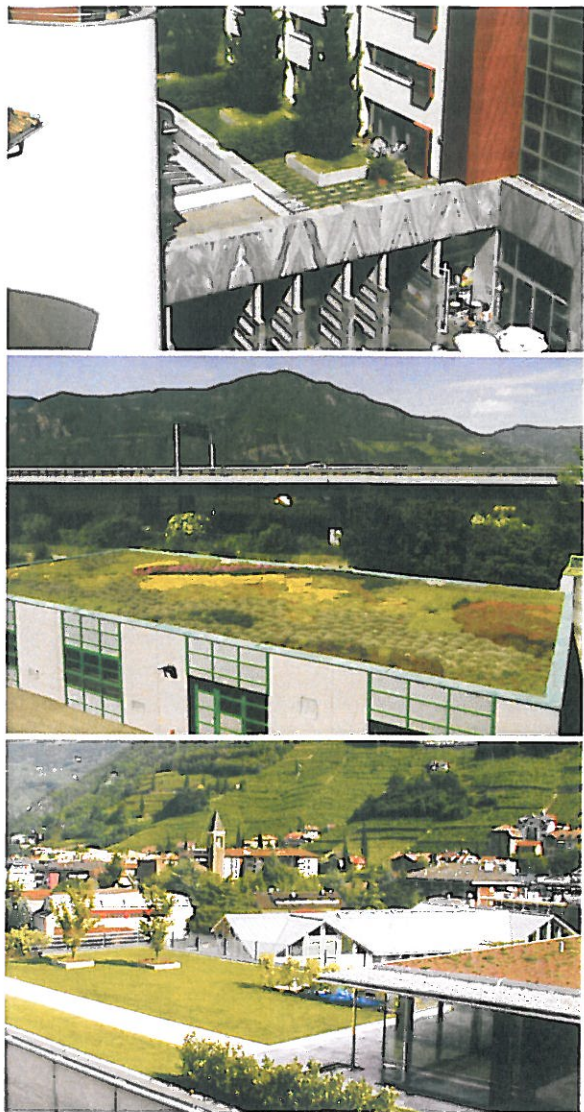
|                               |                        |
|-------------------------------|------------------------|
| Extensive greening new system | 50-60 g/m <sup>2</sup> |
| Extensive greening care       | 50 g/m <sup>2</sup>    |
| Intensive greening new system | 100 g/m <sup>2</sup>   |
| Lawn carrier layer new system | 100 g/m <sup>2</sup>   |
| Intensive greening care       | 60 g/m <sup>2</sup>    |

### 4. Optigreen substrate "Plus"

Optigreen substrates can be enriched and thus pre-fertilized with Optigreen's long term fertilizer on request. There is then no need for initial fertilization during completion care.

## SUMMARY

- Even the best planning and execution will not be successful without regular green roof care and maintenance.
- Use of Optigreen's long term fertilizer Opticote is explicitly recommended.
- Care and maintenance by trained Optigreen partner companies is cheaper and recommendable – it should be taken into consideration in the planning and tendering phase and described in detail.
- Plans should include water connections, roof access and anti-fall protection (see "OPTISAFE" on page 70) to facilitate maintenance work.



## Who we are.

As one of the leading companies in green roofing, Optigrün international AG is in a position to combine decades of experience with continuous innovation and orientation on the demands of the market. Optigrün international AG and its Optigreen partner companies are completely specialised in green roofing buildings and roofs. Every year Optigreen greens about 2 million square metres of green roofs. The Optigreen Partnership Association is represented throughout Europe, Asia and the USA.

- Competent advice through Optigreen Area Managers, Optigreen applications technicians and Optigreen partner companies.
- Many services provided free of charge: Compilation of performance specifications and CAD details, computer-aided calculation of water retention, determination of cost guidelines, etc.
- Object-related, customised solutions.
- Comprehensive product range with many system solutions and partially patented product solutions.
- High quality through both in-house and external quality control. DIN EN ISO 9001 certified.
- Outstanding quality of execution through trained and experienced Optigreen partner companies.
- Compliance with country specific green roofing directives.
- Support following completion: maintenance and service, safety at work, public relations.
- Lobbying for green roofing.
- Training for designers and administration departments.
- Active co-operation in green roofing associations.

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Flag UK Limited  
Marlborough House  
Beacon Hill Road  
Beacon Hill  
Hindhead  
Surrey  
GU26 6QL  
Phone +44 (0) 1428 / 604 500  
Fax +44 (0) 1428 / 606 898  
Web [www.flaguk.co.uk](http://www.flaguk.co.uk)  
E-mail [greenroofs@flaguk.co.uk](mailto:greenroofs@flaguk.co.uk)

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FACHVEREINIGUNG  
BAUWERKSBEGRÜNUNG E.V. (FBB)



Verband für Bauwerksbegrünung

**OPTIGREEN®**  
ROOF GREENING

**GERMANY**  
**Optigrün international AG**  
Am Birkenstock 19  
72505 Krauchenwies  
Tel. +49 (0) 7576 / 772-0  
Fax +49 (0) 7576 / 772-299  
Web [www.optigruen.de](http://www.optigruen.de)  
[www.optigreen.com](http://www.optigreen.com)  
E-mail [info@optigruen.de](mailto:info@optigruen.de)