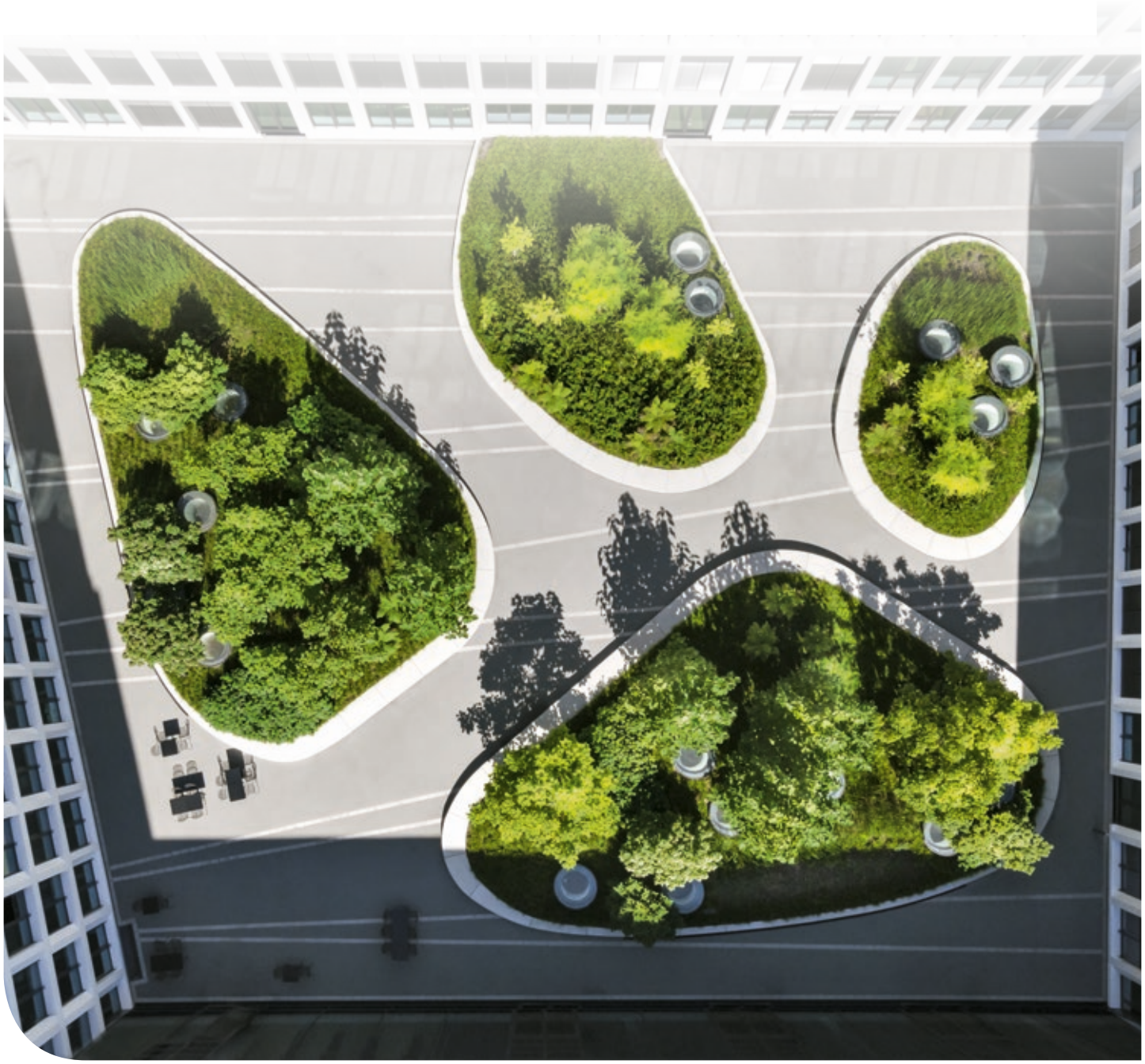
OPTIGRÜN®
ROOF GREENING

FOR UNCOMPROMISING FUNCTION AND VERSATILE DESIGN

OPTIGRÜN RETENTION ROOF FLOW CONTROL



EFFECTIVE STORMWATER MANAGEMENT
RETENTION ROOF FLOW CONTROL

- Flood protection through space for damage-free retention of rainfall events
- Contribution to the restoration of the natural water balance through high evaporation rates
- Promotion of biodiversity

GROWING CHALLENGES DUE TO URBANISATION AND CLIMATE CHANGE

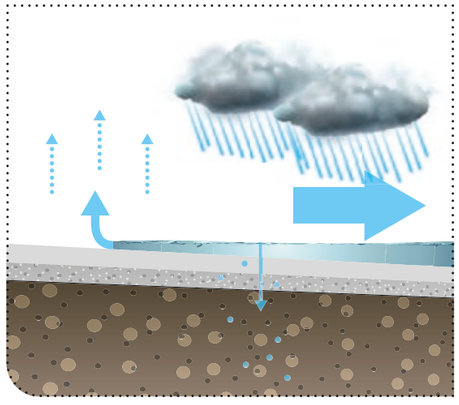
Cities are particularly exposed and vulnerable to climate change. The development of high density urban areas has led to cities becoming significantly warmer, while also leaving no space for the infiltration and evaporation of stormwater.

This combination can result in extreme weather events.

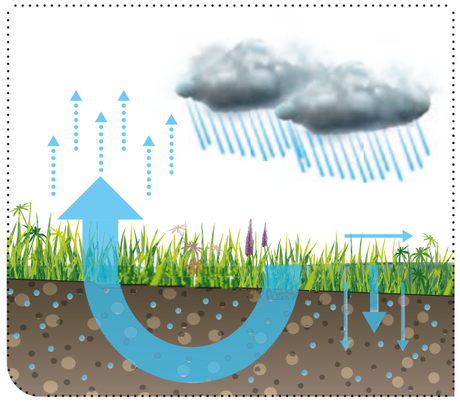
The effects of urban heat islands and flash flooding can lead to property damage and contribute to health problems.

A critical approach to improving the urban climate lies in restoring the natural water balance. Efficient and future-proof systems for stormwater management on roof surfaces, which have often been unused so far, help to ensure that cities remain worth living in.

WATER BALANCE FOR SEALED SURFACES

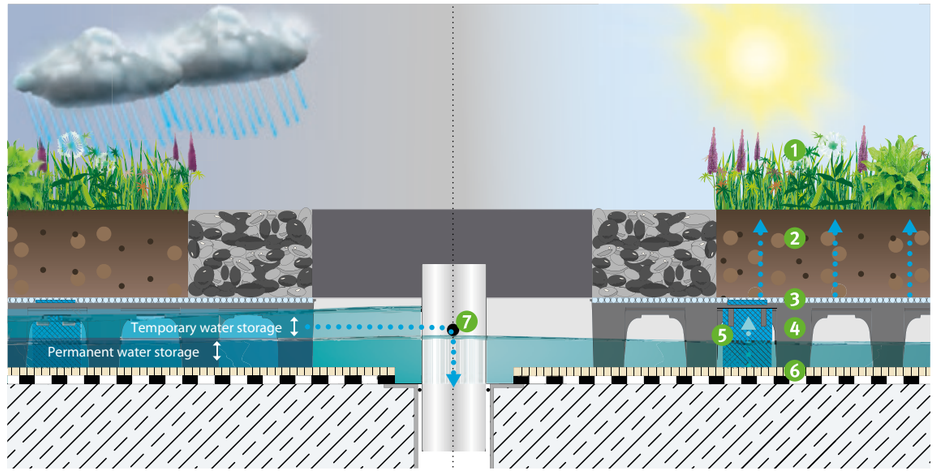


NATURAL WATER BALANCE



A natural water balance helps to sustainably reduce the negative effects of climate change in cities. Due to a high level of evaporation of accumulated rainfall the environment is cooled and infiltration of surface water promotes replenishment of groundwater. The overall low surface runoff is an important component of flood protection.

A RELIABLE SYSTEM WITH MULTIPLE RETENTION BENEFITS



1 Vegetation
2 Substrate
3 Filter and Capillary Fleece
4 Water Retention Box
5 Capillary Bridge
6 Protection and Storage Fleece
7 Flow Control System

Optigrün has developed a special green roof solution for decentralised stormwater management. In the system structure of the RETENTION ROOF FLOW CONTROL, on zero falls roofs (0°) large quantities of rainwater are retained in the 4 Water Retention Boxes. The discharge from the roof surface is strongly regulated by a 7 Flow Control System. As a result, low discharge restrictions can be complied with and protection against flooding is ensured even in the case of rainfall events with high annual frequencies.

Additionally, the stored rainwater is transported into the substrate through 5 Capillary Bridges. The evaporation of the water via the vegetation contributes to maintaining the natural water balance. The greening on a Retention Roof Flow Control with a permanently available water storage creates a habitat for diverse plant and animal species, even during longer periods without rainfall. As a result, city inhabitants also benefit from the biodiversity on green roofs. By binding CO_2 and fine dust from the air, the green roofs actively contribute to health protection and create appealing recreational and social spaces for people.

SPECIFIC COMPONENTS
WITH IMPORTANT FUNCTIONS

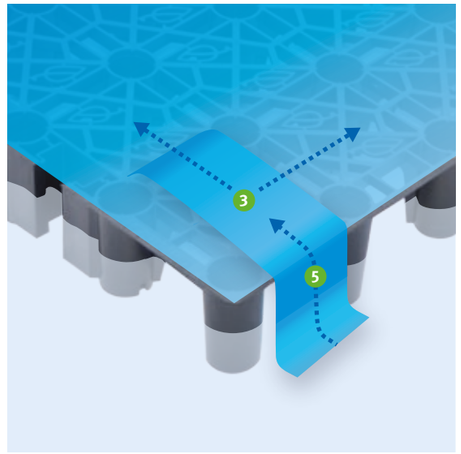
WATER RETENTION BOXES
WRB 80F I WRB 85 I WRB 95 I WRB 170

Water Retention Boxes (WRB) are an essential component of the system solutions “Retention Roof Flow Control” and “Public Roof Retention”. The 80 - 170 mm high void plastic elements create a connected retention space and have a particularly high usable volume. Therefore, the water storage capacity of retention roofs with Water Retention Boxes considerably exceeds that of all other green roof structures.

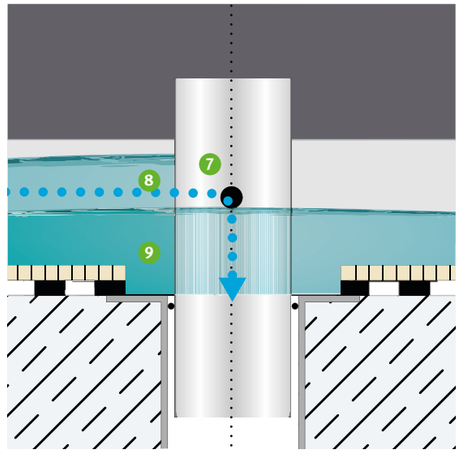
The Water Retention Boxes have special properties that ensure the functionality of the retention roofs:

Under vegetated areas, the integrated 5 Capillary Bridges or Capillary Columns transport stored water back into the 3 Filter and Capillary Fleece, which lies on the top of the boxes. Water is distributed over the entire surface and keeps the overlying substrate layer moist. The optimal water supply of the vegetation leads to a high evaporation rate - as much rainwater as possible is returned to the natural water cycle and the microclimate is improved by evaporative cooling.

Water Retention Boxes are freely flowable due to their structure. The rainwater is distributed quickly and evenly, even in the case of punctual water inflow. This allows reliable calculation of water levels and accurate simulation of overflow frequencies and discharge rates. The available retention volume can be utilised optimally.



FLOW CONTROL
A POWERFUL SYSTEM



The roof outlet is fitted with a 7 static Flow Control System to create a regulated discharge and, if necessary, an accumulation of water in the Water Retention Boxes.
This divides the retention room into a 8 temporary and a 9 permanent water storage. While the temporary storage in the retention room is emptied via the discharge, the permanently stored water is reduced only by evaporation.
The maximum height that the water level on the roof surface should reach is defined in the planning phase. A specifically dimensioned hole in the Flow Control System ensures that rainwater that accumulates above this opening can discharge at a restricted rate.



SMART FLOW CONTROL AND WATER BALANCE CONTROL

Modern stormwater management through the intelligent regulation of retention roofs and the linking of green roofs and civil engineering.

THE RIGHT SOLUTION
FOR EVERY REQUIREMENT

PLUS X AWARD
2025 | Achieved for:
Innovation
High Quality
Ease of Use
Functionality
Ecology
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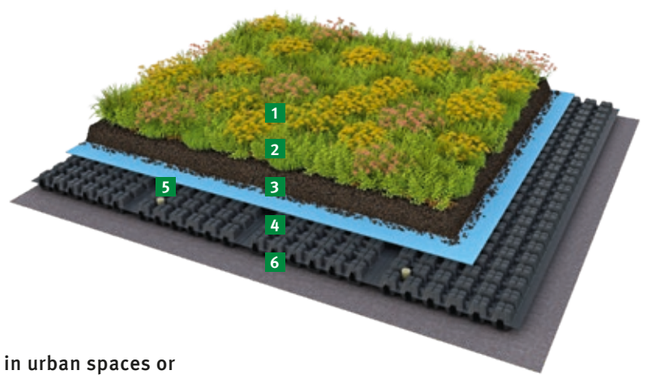
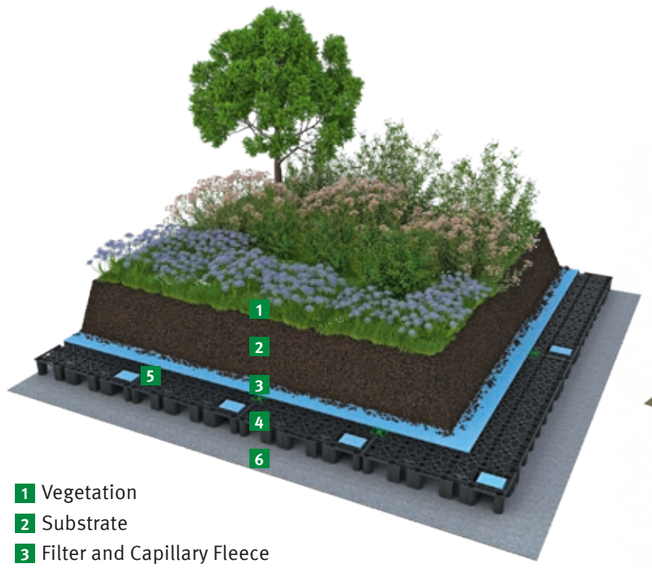
Whether extensive greening, roof gardens as a green oasis in urban spaces or traffic areas on underground garages, Water Retention Boxes enable the multi-functional use of roof surfaces.



Optigrün Retention Roof Flow Control Extensive and semi-intensive

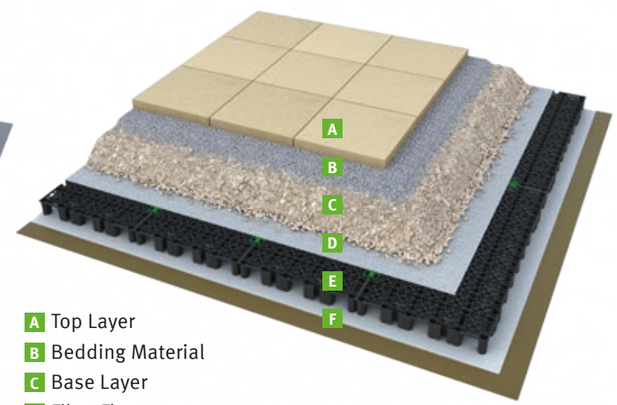


Optigrün Retention Roof Flow Control Intensive



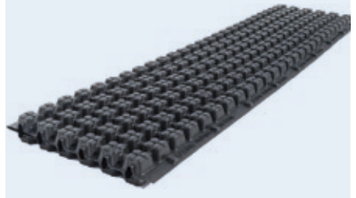
1 Vegetation
2 Substrate
3 Filter and Capillary Fleece
4 Water Retention Box
5 Capillary Bridge/Capillary Column
6 Protection and Storage Fleece

Optigrün Public Roof Retention



A Top Layer
B Bedding Material
C Base Layer
D Filter Fleece
E Water Retention Box
F Protection, Separation and Slip Layers

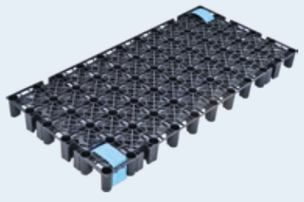
WRB 80F



Nominal thickness	80 mm
Retention volume	approx. 72 l/m²

The Water Retention Box WRB 80F is specially designed for use under extensive and semi-intensive greening. They are particularly light and have a Flow Control-independent water storage.

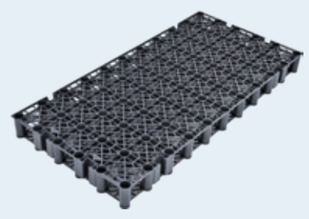
WRB 85



Nominal thickness	85 mm
Retention volume	approx. 80l/m²

Ideal for use under extensive and intensive greening as well as traffic areas.

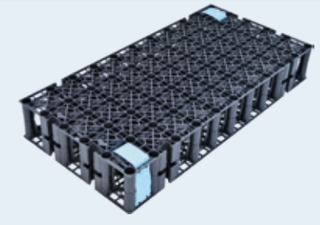
WRB 95



Nominal thickness	95 mm
Retention volume	approx. 90 l/m²

The load-distributing structure of the base plate allows the WRB 95 to be used under intensive greening and traffic areas with particularly high loads on the on the insulation level.

WRB 170



Nominal thickness	170 mm
Retention volume	approx. 161 l/m²

With an especially high retention volume and a closed, load-distributing structure, the WRB 170 is suitable for extensive and intensive greening as well as under traffic areas.

WRB 80F	
Material	Recycled HDPE
Cavity volume	approx. 90 Vol.%
Compressive strength according to DIN ISO 25619-2	approx. 100 kN/m²

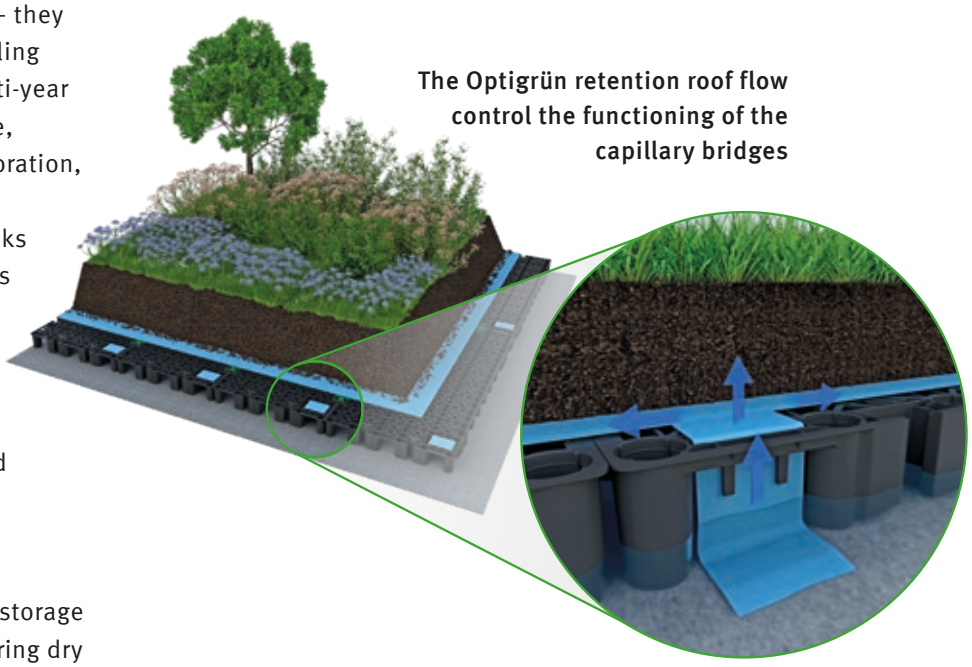
WRB 85, 95, 170	
Material	PP-Recycling-Regenerat
Cavity volume	approx. 95 Vol.%
Compressive strength according to DIN ISO 25619-2	approx. 800 kN/m²

SCIENTIFICALLY PROVEN – RETENTION ROOFS WORK AGAINST HEAT.

RESEARCH RESULTS PROVE THE MICROCLIMATIC EFFECT OF CAPILLARY-ACTIVE RETENTION ROOFS.

Capillary-active retention roofs are not only an effective means of rainwater retention – they also make a proven contribution to cooling urban spaces. Over the course of a multi-year research and measurement programme, tangible effects on water balance, evaporation, and temperature were recorded:

- +14% higher substrate moisture thanks to water storage and capillary bridges
- Surface temperatures up to 30 °C cooler compared to sealed surfaces
- Up to 1.4 °C lower air temperatures above the retention roof
- Significantly reduced heat stress and improved quality of life



The Optigrün retention roof flow control the functioning of the capillary bridges

Roofs with permanently available water storage enable continuous evaporation even during dry periods. The resulting evaporative cooling improves the microclimate – measurably, reliably and permanently.

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