

# BERA® Green Roof Systems

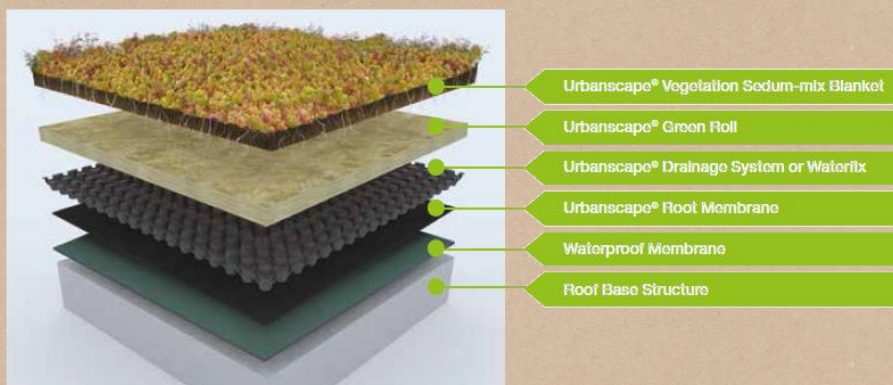
## Why Green Roofs?

The design of buildings has evolved over the years, but the function of buildings has remained remarkably constant: protection, comfort, warmth in winter and coolness in summer. In recent years, however, the environmental impact of buildings and green roof solutions are becoming increasingly important.

With the development of a wider view of sustainability, it is critical to remember that from a building lifecycle perspective the environmental impact of any building comes from its energy consumption during the time it is used, the use of renewable energy and the use of sustainable materials.

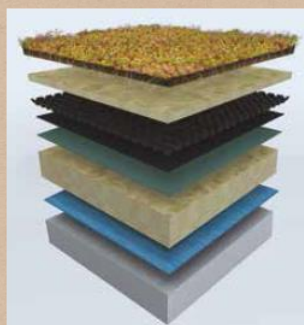
Green roofs go beyond the meaning of contemporary architecture and give a new value to the role of buildings within urban planning. They are designed not only to bring back the natural element in the urban environment but also to provide solutions for important issues such as urban heat island effect and stormwater management.

## BERA® Urbanscape Green Roof System

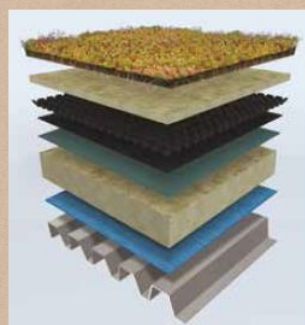


## Types of Roofs

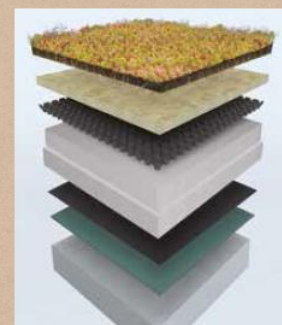
Urbanscape® Green Roof System can be installed on any type of roof construction: on concrete or steel deck, inverted roof construction or any other type of material used on roofs. The green roof elements are the same in all cases, only the demands on the insulation and the position of waterproof membrane change.



Warm roof on concrete deck



Warm roof on steel deck



Inverted roof



## What are the main Green Roof benefits?

### Environmental Benefits:

#### ✔ Reduction of Urban Heat Island Effect:

Green roofs are one of the most effective ways to reduce the ambient air temperature in urban areas. During summer the temperatures in cities are approximately 5-7 °C higher than in the countryside due to buildings and roads heat absorption and the temperature on the traditional roof can be up to 40 °C higher compared to the green roof. According to research carried out by the Tyndall Centre for Climate Change there is a need of 10% more greenery in towns to mitigate the UHI Effect.

#### ✔ CO<sub>2</sub> reduction:

Green roofs help to reduce the amount of CO<sub>2</sub> in the air, which is considered one of the most important causes of global warming. 1 m<sup>2</sup> of a green roof can absorb 5 kg of CO<sub>2</sub> yearly. Additionally, due to reduced energy consumption there is a further impact on carbon dioxide reduction by 3.2 kg yearly\*. As a perspective, 1 m<sup>2</sup> of green roof can absorb the same quantity of CO<sub>2</sub> as a regular car would emit during an 80km drive.

#### ✔ Rainwater retention:

A major advantage of green roofs is the reduction of storm water run-off, which leads to a decrease of the burden on sewer systems by 70-95% in summer. Green roofs have influence on cost reduction due to low or no need for rain-catching cisterns and similar equipment which is usually used for storm water management. Rainwater retention capability helps to limit accidents caused by heavy rainfalls.

#### ✔ Cleaner air:

The plants on green roofs can also capture airborne particles such as smog, heavy metals and volatile organic compounds from the local atmosphere which has a positive effect on air quality and health of inhabitants. Researchers estimate that 1 m<sup>2</sup> of a green roof can help to absorb 0.2 kg of airborne particles from the air every year\*\*.

#### ✔ Rainwater purification:

Through natural bio-filtration, green roofs prevent contaminants and toxins from reaching streams and waterways. According to Kohler & Schmidt research (1990) 95% of the lead, copper and cadmium sulphide and 19% of the zinc coming from the rainwater remains in the substrate, which helps to improve local water quality.

#### ✔ Natural habitat:

As urbanization increases, ensuring biodiversity is one of the key requirements for local councils. Green roofs can provide a habitat for various species and restore the ecological cycle disrupted by urban infrastructure.

## Economic Benefits

#### ✔ Extended roof life:

Green roofs have been shown to triple the life expectancy of the roof. The underlying roof materials are protected from mechanical damage, ultraviolet radiation and extreme temperatures, which results in reduced maintenance and renovation costs.

#### ✔ Energy efficiency:

Green roofs help to reduce energy consumption by 25% for heating and 75% for cooling\*. With rising energy prices lower heating and cooling costs become increasingly appealing.

#### ✔ Noise reduction:

A green roof system provides good sound insulation, keeps the living space quieter and creates more pleasant surroundings in urban areas. It contributes to noise reduction in large cities, near industrial areas and airports.

## Social Benefits

#### ✔ Natural look:

The natural character of green roofs provides relief from the concrete construction in urban areas and introduces substantial changes to modern architecture. According to several studies the presence of green areas has a relaxing psychological effect, helps to reduce blood pressure and lowers the heartbeat. Due to multiple benefits, green roofs substantially enhance residential and commercial property values.

#### ✔ Usable green space:

Green roofs help to provide additional green space in urban areas with limited open space and add value to buildings. Accessible roofs can be designed as community gardens, commercial or recreational space allowing numerous use opportunities.

#### ✔ Urban agriculture:

Green roofs can additionally create opportunities for urban agriculture. They can reduce a community's urban footprint thanks to local food system creation and ensure self-reliance on food resources.

\*National Research Council of Canada

\*\*United States Environmental Protection Agency EPA -  
Reducing UHI: Compendium of Strategies



## Types of Green Roofs

There are two main types of green roofs

### Extensive green roofs



Extensive green roofs have shallow (typically 7–10 cm) soils. They support sedums, moss, herbs and grasses and other vegetation where low or no maintenance is required. They are the lightest type of green roof. Extensive green roofs provide attractive protection to the waterproof membrane and significantly reduce water run-off. When the green roof is

completed inspection once or twice per year shall be provided. Regular fertilization once per year, in fall or early spring, is required to ensure proper growth and success. The irrigation system is not needed, unless there are extremely long periods of dry weather conditions. Regular access to the extensive green roof is not required.

### Intensive green roofs



Intensive green roofs have a deeper soil layer (15cm upwards) and a wider variety of plant types can be grown, from lawns to ornamental bushes and semi mature trees. The type of planting will determine the depth of soil required, the need for an irrigation system and the level of maintenance. Regular roof access is normally provided on this type of green roof,

therefore paved areas, walls and even water features are incorporated in the design.

Variables	Extensive	Intensive
Vegetation	Sedum, grass, herbs	Grass, ornamental bushes, trees
Height	<15cm	25 – 100cm
Irrigation	Mostly not	Always necessary
Walking possibility	No/Limited	Yes
Water buffer	4 – 12 mm	18 – 39 mm
Load capacity roof	Most normally sufficient	Requires extra strong roof structure
Maintenance	Very low	Comparable with a normal garden
Roof pitch	Up to 45°	Flat or in terraces

\*All data is subject to change without prior notice by the manufacturer.



## Why BERA® Urbanscape?

BERA® Urbanscape Green Roof System guarantees:

### ✔ Complete solution:

BERA® Urbanscape Green Roof System is provided with complete, easy to install layers delivered directly to the customer. Due to the use of new innovative Urbanscape® Green Roll, no special equipment is required for installation and maintenance.

### ✔ Lightness:

Urbanscape® Green Roll being a core of the Urbanscape® Green Roof System is lighter compared to the traditional soil substrate and can be used on almost any building structure without compromising the structural stability. On average Urbanscape® Green Roll is 8-10 times lighter and can hold up to 3-4 times more water per its volume than other green roof substrates.

### ✔ Efficient installation:

Urbanscape® Green Roll ensures significantly lower labor intensity. For sufficient water absorption capacity and appropriate growing base for vegetation of 1000 m<sup>2</sup> of green roof, 2-5 tons of Urbanscape® Green Roll Substrate are needed compared to above 100 tons of traditional green roof substrates.

### ✔ Sustainable Solution:

Urbanscape® Green Roll is made from various rock mixtures which are widely available in nature. The lightweight open structure promotes extensive root distribution and plant growth.

### ✔ High water absorption:

Urbanscape® Green Roll provides for fast and long-term stable water re-absorption and water retention performance. Depending on climate zones, different types of Urbanscape® Green Roll are used.

### ✔ High water distribution

BERA® Urbanscape system provides for an irrigation system and the perfect water distribution between vegetation layer and the Urbanscape® Green Roll. It has the advantage to save water in relation to sprinklers that irrigate on top of the vegetation.

### ✔ High thermal performance:

BERA® Urbanscape system ensures a long-lasting cooling effect due to the high-water storage capacity. Roofs with Urbanscape® Green Roof System reduce heat gain compared to the non-vegetated roofs due to the thermal mass, extra insulation, and evapotranspiration associated with the vegetative roofing systems.

✔ High fire resistance:

A1 Euroclass of non-combustibility is confirmed for Urbanscape® Green Roll. According to EN 13501- 1, Class A1 products will not contribute in any stage of the fire including the fully developed fire.

✔ High acoustic performance

Urbanscape® Green Roof System reduces noise pollution through surface absorption and provides mitigation of unacceptable noise levels that affect health, safety and the well-being of the urban population.

## BERA® Urbanscape – Complete Solution

### BERA® Urbanscape Root Membrane



BERA® Urbanscape Root Membrane is made from black LD Polyethylene regenerate foil which is used to prevent the roots penetrating in green roofs.

Property	Unit	value	Standard
Average thickness	mm	0.5 (+/-10%)	ISO 4591
Width	m	4 (+/-2%)	ISO 4591/2
Length	m	25 (+/-3%)	

\*All data is subject to change without prior notice by the manufacturer.

### BERA® Urbanscape Drainage System with buffer



The BERA® Urbanscape Drainage System with buffer is a double- sided drainage and reservoir board made from recycled high-impact recycled polystyrene with excellent load bearing capacity specifically designed for green roofs. The panels are perforated on one side to allow installation with the holes on the upper side for water retention. It

ensures the buffering of water in dry periods and rapid drainage of water in wet periods in green roofs and additionally aerates the root system of the plants. The drainage system is made of high-quality plastic to ensure that the system is lighter and more compact comparing to regular drainage layers.

Property	Unit	value	Standard
Height	mm	25	
Width	m	1.1	
Length	m	2.02	
Rain water retention capacity	l/m <sup>2</sup>	11.8	
Compressive strength	kN/m <sup>2</sup>	444	EN-ISO 25619-2

\*All data is subject to change without prior notice by the manufacturer.



## BERA® Urbanscape Drainage System Universal



BERA® Urbanscape Drainage System Universal is a high-performance CE-marked drainage system with an innovative dimple design made out of recycled high impact polystyrene. It acts as a drainage, separation and protection layer. The core of the drainage system is a perforated dimpled sheet with a high compressive strength and a construction height of approx. 12.5 mm. A non-woven geotextile is bonded to each dimple as a separation and protection layer. The drainage system is a protection layer in accordance with DIN 18531 “Waterproofing of roofs - Sealings for non-utilized roofs”.

The drainage system is a protection layer in accordance with DIN 18531 “Waterproofing of roofs - Sealings for non-utilized roofs”.

Property	Unit	value	Standard
Height	mm	12.5	
Width	m	1.2	
Length	m	10	
Compressive strength	kN/m <sup>2</sup>	Approx. 300	EN-ISO 25619-2

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## BERA® Urbanscape Drainage System Drain mat



BERA® Urbanscape Drain mat is a three-dimensional, light and flexible composite matting made up of a drainage core of looped polypropylene filaments, which gives it a high drainage capacity, provided on both sides with a nonwoven filter fabric. The components are thermally bonded together over the entire contact area. The top nonwoven filter extends 100 mm to one side of the core. This ensures that the joint is covered when lanes of Urbanscape® Drainmat are laid adjacent to one another.

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Property	Unit	value	Standard
Average thickness	mm	20	
Width	m	1.0	
Length	m	35	
Tensile strength – longitudinal direction	kN/m <sup>2</sup>	8	EN-ISO 10319
Tensile strength – transversal direction	kN/m <sup>2</sup>	8	EN-ISO 10319

\*All data is subject to change without prior notice by the manufacturer.

## BERA® Urbanscape Green Roll (HTC GR)



BERA® Urbanscape Green Roll (HTC GR) is a lightweight product made of long rock mineral wool fibers specially needed to form a compact and dimensionally stable felt. The product is made solely of virgin rock mineral fibers. Urbanscape® Green Roll ensures excellent water retention and conservation in green roofs and is a good growing

medium made from various mineral mixtures. Urbanscape® Green Roll (HTC GR)

Product	Thickness (mm)	Water retention (l/m <sup>2</sup> )	Weight (kg/m <sup>2</sup> )
Green Roll	20	17	2.20
Green Roll	40	29	4.40

Property	Unit	value	Standard
Width	m	1	EN 822
Length	M	3	EN 822
Thickness	mm	20-40	EN 823 (50Pa)
Nominal density*	kg/m <sup>3</sup>	100-110	EN 1602
Reaction to fire		Euroclass A1	EN 13501-1

\*All data is subject to change without prior notice by the manufacturer.

## Urbanscape® Vegetation, i.e. Sedum-mix Blanket



Depending on local climatic conditions and designs by the architect's vegetation can be selected. The biodegradable Urbanscape® Sedum-mix blankets comprise eight to twelve different species of Sedum. The blankets boast at least 95% coverage upon delivery. Urbanscape® vegetation blankets are produced in accordance with FLL guidelines. The sebaceous Sedum

plants are adept at storing water in their leaves and are therefore extremely suitable for varying weather conditions.

Property	Unit	value
Thickness	mm	20-40
Coverage	%	95
Standard size	m	1 x 1.2
Max roll length	m	20-25

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