



# GREEN SOLUTIONS

Hydrophilic wool



# GREEN SOLUTIONS

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# BLUE-GREEN INFRASTRUCTURE

Isover thinks about the environment

Blue-green infrastructure is a network of water and green features built in harmony with nature in developed areas. These elements are used in architecture and urban planning to address climate issues, retain water in cities and improve the climate. Their impact on the quality of the environment, the city and people's health is highly significant. Blue-green infrastructure includes water features for rainwater capture, management and treatment. Together with green elements, i.e. flora, it increases the diversity of animal and plant species, soil quality and groundwater status, reduces air pollution, improves the microclimate, reduces overheating and mitigates the risk of floods and extreme drought.

## Elements of blue-green infrastructure:

- Water areas – ponds, lakes, reservoirs, wetlands.
- Watercourses – rivers, streams, water canals.
- Retention basins, soakage areas.
- Green spaces – parks, trees, alleys, grass strips.
- Green roofs - extensive, intensive, biodiverse, ...
- Green façades.
- Blue Roofs.

## Greenery in architecture

Bosco Verticale (Vertical Gardens) is a residential project of two high-rise buildings in Milan, Italy. These are towers 110 and 80 metres tall that are meant to attract attention, but also to solve the problem of the lack of green spaces in cities. The basic idea of the project is to replace the developed area with a much larger area of vegetation. Featuring 700 trees, 5,000 shrubs and over 10,000 smaller plants, it is the largest green wall project in the world. The buildings cool the surrounding environment, trap smog and create a suitable environment for many animals. This project has been acclaimed around the world and has inspired many other projects, such as the Wonderwoods in the Netherlands and the green skyscrapers in Nanjing, China.



## Benefits of blue-green Isover solutions:

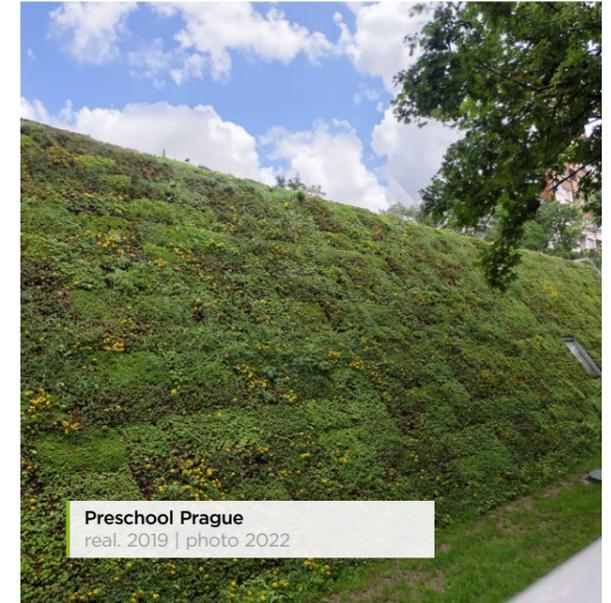
-  Increased aesthetic and architectural value – view of greenery, higher property value, connection with nature
-  Social interaction – roof gardens as a space for meeting and relaxation
-  Local environmental improvement – diverse plant composition, smog trapping, photosynthesis
-  Heat island reduction – significant reduction in surface temperatures and less heat accumulation
-  Rainwater management – local water retention, subsequent evaporation
-  Improving indoor microclimate – increases thermal comfort indoors, prevents overheating of buildings
-  Improved acoustics – reduces environmental noise and contributes to acoustic comfort
-  Reduces operating expenses – reduces air conditioning costs, increases the efficiency of photovoltaic panels, extends the life of the water-proofing



# REFERENCES



Production hall Brno  
real. 2020 | photo 2023



Preschool Prague  
real. 2019 | photo 2022



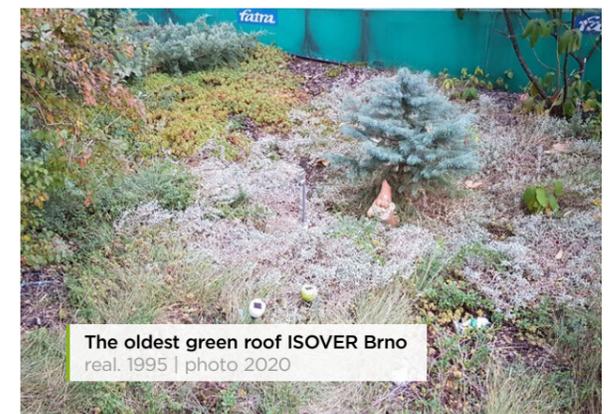
"Naše střecha", Jakub Cígler Architects, Prague  
real. 2019 | photo 2022



Warehouse Lithuania  
real. 2016 | photo 2018



Family house Prague  
real. 2016 | photo 2020



The oldest green roof ISOVER Brno  
real. 1995 | photo 2020

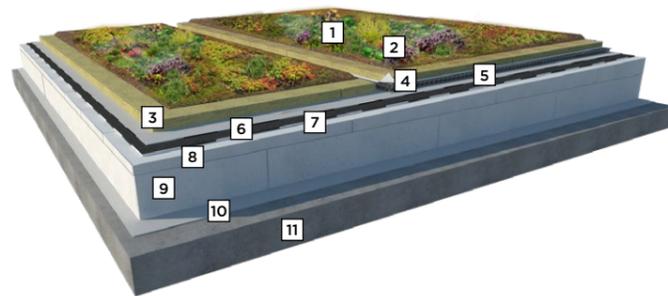
# GREEN AND BLUE ISOVER ROOFS

## Basic division

### Isover energy-efficient roof

extensive green roof

- 1 Extensive vegetation – sedums, sempervivums, succulents
- 2 Extensive mineral substrate, 30 mm thick
- 3 Isover Flora hydrophilic panels, thickness 50 mm
- 4 Filter fabric, 120 g/m<sup>2</sup> (only used with dimpled membrane)
- 5 Drainage dimpled membrane (use depends on drainage capacity calculation)
- 6 Protective geotextiles, 300 g/m<sup>2</sup>
- 7 Water-proofing resistant to root penetration
- 8 Isover EPS 150 thermal insulation gradient wedges
- 9 Isover EPS 100 thermal insulation
- 10 Vapour barrier
- 11 Supporting roof structure



- + Rainwater retention
- + Most affordable
- + Easy implementation
- + Low maintenance
- + Low weight
- Limited choice of vegetation
- Can't be walked on at all times

The most common type of green roofs are compositions with low xerophytic vegetation. They are low maintenance and also the most affordable. Recommended plants include sedums, sempervivums and other plants that can tolerate extreme roof conditions. The appearance and colour of sedums changes throughout the year. This type of green roof retains more water than a roof without plants. It is also lightweight and suitable for the reconstruction of houses, pergolas, ...

### Isover roof meadow

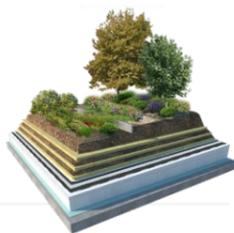
semi-intensive green roof



- + More diverse plant mix (grasses, herbs)
- + Can be regularly walked on
- + Can be combined with utility function (growing vegetables, herbs)
- More demanding maintenance
- Greater weight of vegetation layer

### Isover roof garden

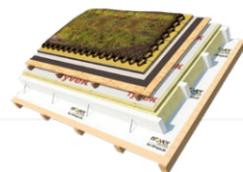
intensive green roof



- + High plant diversity (lawn, shrubs, trees)
- + Significant aesthetic and architectural value
- + Space for relaxation and gathering
- Very demanding maintenance
- High demands on the load-bearing elements of the structure
- The most financially demanding

### Isover pitched roof

extensive green pitched roof



- + Low maintenance
- + Low weight
- + For pitches up to 80°
- Anti-slide stabilisation required
- Drainage retarders required

### Isover blue roof

blue roof



- + Ability to retain rainwater
- + Affordable solution
- + Almost maintenance-free solution
- No aesthetic and ecological function
- Without some of the benefits of green roofs

# GREEN AND BLUE ISOVER ROOFS

## Solutions for a demanding clientele

### Photovoltaic panels on a green roof

Photovoltaic panels are one way to use renewable energy sources. The combination of these panels and a green roof brings many benefits. The most important one is the significant increase in the efficiency of the photovoltaic panels due to the lower ambient air temperature contributed by the green roof.

- + Green roof reduces ambient temperature and dust
- + Photovoltaic panels have a significantly higher efficiency at lower temperatures
- + Different habitats have a positive impact on biodiversity
- Implementation costs
- Higher requirements for the load-bearing capacity of thermal insulation



### Biodiverse green roof

The biodiverse roof functions in maximum harmony with the surrounding fauna and flora, providing species diversity for small animals, insects and plants. A variety of environments, materials and non-living elements create diverse habitats for different species. A biodiverse roof is low-maintenance and brings significant environmental benefits.

- + Close connection with nature
- + Diverse environment suitable for many plants and animals
- + Low maintenance
- + Low implementation costs
- Locally higher loads on the structure
- Can be walked on only partially

### Isover roof pond

A rooftop pond is another option for managing rainwater. This is an interesting element that brings additional possibilities in the use of the roof. Depending on technical and financial possibilities, shallow wetlands, deeper ponds for growing water lilies and other plants or for bathing can be implemented.

- + Distinctive architectural element
- + Water retention
- + Biodiversity - plant and animal species diversity
- High demands on implementation
- Demanding maintenance



### Environmental Product Declaration

- Our goal is to provide long-term to reduce the impact of our products on the environment. These parameters we declare in our EPDs.
- EPDs for products available in CZ and EN can be downloaded at: [www.isover.cz/environmentalni-prohlaseni-o-produktu](http://www.isover.cz/environmentalni-prohlaseni-o-produktu)



### Need to know more?



**Isover Green Roof Catalogue**  
[www.isover.cz/dokumenty/katalogy-prospekty/isover-vegetacni-strechy.pdf](http://www.isover.cz/dokumenty/katalogy-prospekty/isover-vegetacni-strechy.pdf)



**More about blue-green solutions**  
[www.isover.cz/aplikace/modro-zelena-reseni](http://www.isover.cz/aplikace/modro-zelena-reseni)



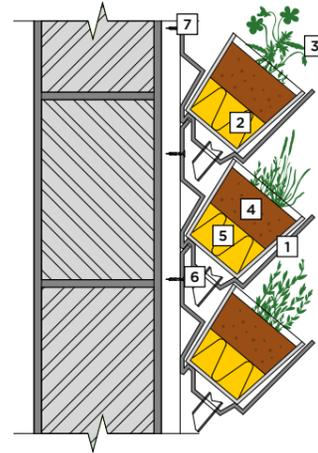
**Technical documents**  
 You can download design details and compositions in .pdf and .dwg format on the website [www.isover.cz/konstrukcni-detaily](http://www.isover.cz/konstrukcni-detaily)

# GREEN ISOVER FAÇADES

Let's give cities a chance to breathe again

## Flora Panel green façade

- 1 Flora Panel 850
- 2 FloraPot
- 3 Vegetation
- 4 Growing medium
- 5 Isover Intense water retention layer
- 6 Level overflow
- 7 Self-drilling screw



- + Improves air quality and reduces dust
- + Increases thermal comfort indoors
- + Increases the architectural value of the building
- + Easy implementation
- + Closed water circuit
- Requires regular irrigation and maintenance

Green façades provide another opportunity to bring greenery back into developed areas. They contribute to improving the microclimate in their surroundings, but also have a positive effect on the indoor environment in buildings and produce air conditioning savings. The unique Flora Panel system solution makes implementation easier and simplifies maintenance. The solution offers a large number of plants for both extensive and intensive green façades. The Flora Panel system can be used both outdoors on building façades and indoors as a design element.

## Flora exterior extensive extensive green façade



- + Low implementation costs
- + Simple maintenance 1x per year
- + Lasts up to 2 weeks without irrigation
- + Minimum water consumption for irrigation
- Limited selection of suitable plant species

## Flora exterior intensive intensive green façade



- + Wide selection of plants
- + Supports biodiversity
- + Distinctive architectural element
- + Possibility of seasonal plant exchange
- Higher water consumption
- Regular maintenance required 1x per month

## Flora Panel System Solution



- Flora Urbanica offers solutions for green roofs and green façades. It participates in the development of new products, implements green solutions and offers expert advice.
- The Flora Panel façade greening system was developed in cooperation with the company Flora

## Need to know more?

 **Catalogue - Isover Green Façades**  
[www.isover.cz/dokumenty/katalogy-prospekty/isover-zelene-fasady.pdf](http://www.isover.cz/dokumenty/katalogy-prospekty/isover-zelene-fasady.pdf)

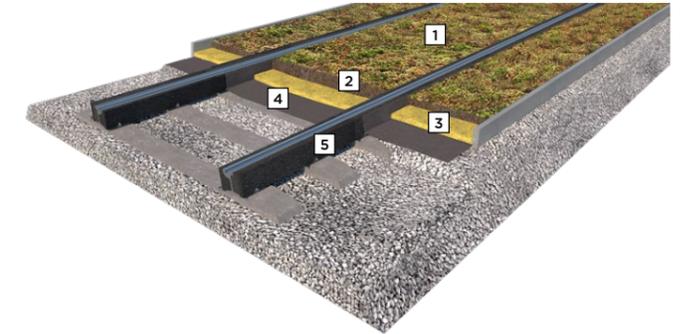
 **Installation instructions - Green façades**  
[www.isover.cz/montazni-navod/zelene-fasady](http://www.isover.cz/montazni-navod/zelene-fasady)

# GREEN ISOVER SOLUTIONS IN THE LANDSCAPE

The use of hydrophilic wool is constantly expanding

## ISOVER G-Tram system greening of tram lanes

- 1 Extensive vegetation - sedums, sempervivums
- 2 Extensive mineral substrate
- 3 Isover Flora or Isover Intense hydrophilic panels
- 4 Protective geotextiles, 300 g/m<sup>2</sup>
- 5 Track superstructure



- + No irrigation required
- + Maintenance-free solution
- + Reduces noise from tram traffic
- + Increases acoustic comfort in cities
- + High biodiversity value
- + Variable appearance throughout the year
- Cannot be walked or driven on

The term green track refers to the application of a vegetation layer to the track superstructure. The Isover G-TRAM solution takes advantage of many years of knowledge in the field of green roofs. This has also influenced the choice of plants - xerophytic plants are recommended. They prefer a sunny habitat and do not require as much water as is needed when greening tramlines with grasses. The advantage of the extensive form of greenery is the variety of colours and variability throughout the year, low maintenance and the possibility of using the same surface in the area of tram stops.

## Solitaire planters exterior/interior



- + Heat island reduction
- + Temperature reduction in city centres
- + Dust particle absorption
- + Noise reduction
- + Local rainwater retention
- + Improvement of microclimate
- Slightly more challenging implementation

## Retention panels below ground level



- + Rainwater management
- + Local rainwater retention
- + Reduced need for irrigation
- + Low implementation costs
- Slightly more challenging implementation

## Acoustic tests

- Hydrophilic mineral wool products have excellent acoustic properties.
- The performed acoustic

tests show that even the basic Economy variant of Isover roofs has demonstrably improved the air sound insulation of the roof structure by 6 dB.



## Need to know more?

 **For more information, download the separate brochure at**  
[www.isover.cz](http://www.isover.cz) > Isover G-Tram

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 **Sample of Isover Flora material**  
 Email [podpora@saint-gobain.com](mailto:podpora@saint-gobain.com) for a sample of hydrophilic wool

# REFERENCES



The first tram line with Sedum in CZ, Prague  
real. 2018 | photo 2022



Extensive green facade Brno  
real. 2019 | photo 2020



The first 3D printed house with our green facade Prague  
real. 2020 | photo 2021



Extensive tram line Ostrava  
real. 2022 | photo 2023



Garden pool Lipno  
real. 2016 | photo 2018



Retention panels in the parking lot Liberec  
real. 2021

# ISOVER HYDROPHILIC WOOL

Natural origin and connection with nature

The basic raw materials for the production of mineral wool are basalt and diabase, some of the most abundant rocks on Earth, which are formed by volcanic activity (past and present). These rocks are melted in a furnace during the production process and the resulting lava is then pulped into a structure of fine fibres with diameters finer than a human hair. Nature offers an analogy to this production process, which is a precursor to soil formation.

At the sites of active volcanoes, one can encounter natural filamentous lava, e.g. in Hawaii, Pele's hair, where tufts of strands of igneous rock can reach up to two metres in length. However, the fibres formed in this way are without a binder, so the tufts do not hold their shape. Thanks to the industrial addition of a binder, the fibres become a solid board that can be used in vegetation layers for green applications.



### Advantages of mineral wool over substrate:

- + Higher hydro-accumulation capacity
- + Lower weight in dry state
- + Lower weight in wet state
- + Better thermal insulation properties

### Why choose Isover green roofs:



**3 times lighter in dry state**

You save on shipping and handling.



**4 times better insulation in summer and winter**

"Cool in summer, warm in winter."



**25% lighter when wet**

Save on the supporting structure.



**Retains 35% more water**

It does not require frequent irrigation and leaves more water in the landscape.

### Isover Flora



### HYDRO-ACCUMULATION PANELS

They are used for extensive and semi-intensive compositions of flat and pitched roofs as a partial substrate replacement. They are light and airy, which makes them easier to handle and transport than substrates. They are used in green roof compositions on new buildings, but are also suitable for renovations and hall buildings. They have a balanced ratio between hydro-accumulation and water permeability. This ensures that water drains away in the event of a large amount of water in the volume of the panels and prevents waterlogging of the composition. It is delivered in bundles, bundles on pallets, but also the panels themselves on pallets.

Thickness (mm)	Dimensions (mm)	Packaging (m <sup>2</sup> )	Pallet (m <sup>2</sup> )	Pallet (m <sup>3</sup> )	
30	600 × 1 000	6.0	48.0	1.44	NEW
50	600 × 1 000	4.8	28.8	1.44	
50	1 000 × 1 200	-	28.8	1.44	NEW
100*	600 × 1 000	2.4	14.4	1.44	
100*	1 000 × 1 200	-	14.4	1.44	NEW

\* Non-standard product, delivery terms on request.

### Isover Intense



### REINFORCED HYDRO-ACCUMULATION PANELS

Reinforced hydro-accumulation panels used in applications with a greater vegetation layer thickness. Especially for intensive green roofs, where it is advantageous to layer these panels with mineral roofing substrates. They are also applied to places with higher traffic. Thanks to their greater hydro-accumulation, they are more suitable for pitched green roofs. It is delivered in bundles, bundles on pallets, but also the panels themselves on pallets.

Thickness (mm)	Dimensions (mm)	Packaging (m <sup>2</sup> )	Pallet (m <sup>2</sup> )	Pallet (m <sup>3</sup> )	
25	1200 × 1000	-	60	1,50	NEW
50	600 × 1 000	3,0	30,00	1,50	
100	600 × 1 000	1,8	14,40	1,44	

# Need some advice?

Contact our Business and Technical Support Centre.

Monday - Friday 7.30 - 17.00

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