BAUDER

Bauder extensive planting –
Low maintenance Green Roof System

Pitched roof systems | Flat roof systems | Green roof systems

Diversity for healthy growth

Contents

Extensive planting – more than a protective eco-layer

In line with the general trend towards eco-building, the extensive planting system has now been established for some time. However, it is much more than a simple protective eco-layer or a necessary balancing measure.

Extensive planting systems store water, bind dust, barely heat up at all, even at extreme temperatures, and therefore bring about a sustainable improvement in the micro-climate on the roof. They create a positive image, improve the quality of life and also contribute to the increased appreciation of the building value.

Flora and fauna happily populate new habitats and the roof itself enjoys a longer life, because it is effectively protected against environmental influences. There is also the added bonus of a reduction in the ‘rain tax’ in areas where they have split the waste water drainage charge.

More and more developers are becoming convinced of these benefits and are investing in green roof landscapes. The costs for this investment are transparent, because thin-layer constructions with a corresponding low weight per unit area and natural-looking vegetation that manages without artificial irrigation make extensive planting a cost-effective, low-maintenance form of roof planting.

Extensive planting to suit individual requirements

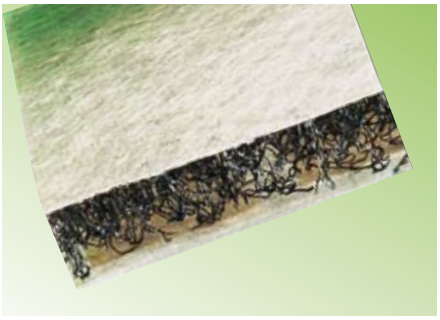
The multi-layer construction, made up of a filter, drainage and vegetation layer, offers the best conditions for maintaining long-lasting, high quality extensive planting schemes.

The demands made on the extensive planting system construction vary according to the roof situation and the planting objective. The entire bandwidth, from particularly economical constructions to very sophisticated planting systems, can be achieved with the Bauder system options. Special solutions, like planting roofs without any fall, for example, or drainage passing underneath planting and covering areas requiring greater capacity to withstand pressure, can be created easily and reliably with Bauder.

The criteria for choosing the right system are described on the following page. The brief descriptions provide a decision-making aid for selecting the best system solution based on the demands made on the drainage layer. The Bauder plant compost R-E has proved particularly successful in accommodating the vegetation layer. However, all the other Bauder extensive vegetation substrates can, of course, also be used for multi-layer constructions.

Criteria for selecting the system

Bauder SDF mat – the budget drainage system

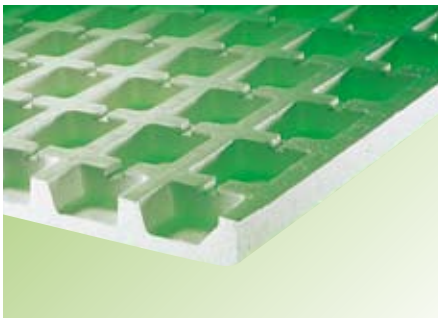


If no particular demands are made on the drainage layer, the SDF mat can be used for the construction. The SDF mat allows the protective, drainage and filter layer to be installed in a single operation and is therefore correspondingly cheaper. The construction with the SDF mat is our standard construction for extensive planting using a multi-layer system. Because of its permeable drainage, it can also be used with a reversed roof (see page 7).

Bauder drainage and storage element N 20 – the drainage system that will withstand pressure

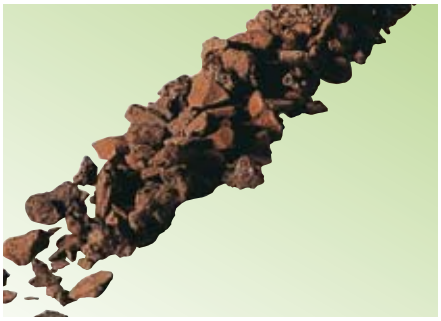
If drainage passes under planting or terrace slabs, the Bauder drainage and storage element N 20 needs to be installed instead of the SDF mat. This element is essentially able to withstand greater pressure and is also suitable as drainage under marginal paving slabs set in a mortar bed (see page 8).

Bauder water storage panel – the sophisticated planting system



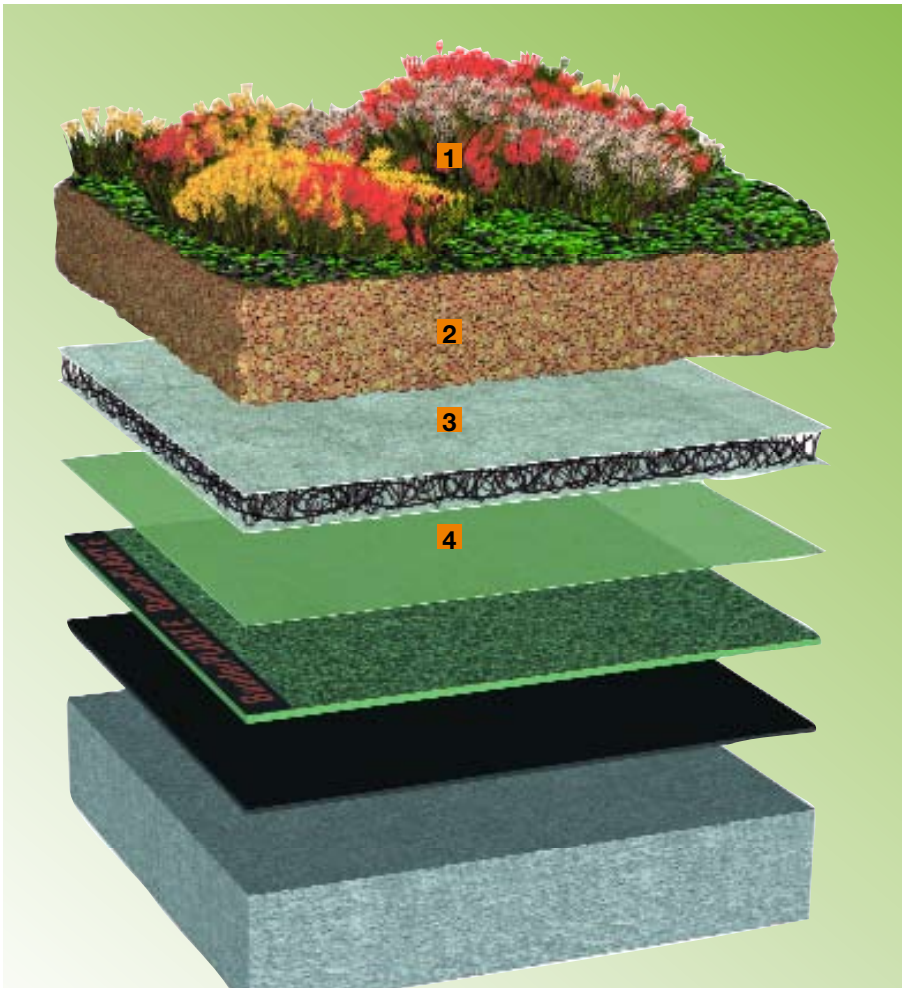
The high storage capacity of the Bauder water storage panel offers the best growing conditions for the vegetation. The thickness of the panel – 50 mm – also allows the planting of roofs without any fall. Any water that accumulates is displaced by the panel (see page 10).

Bauder mineral drain – coarse mineral particles



Instead of plastic sheet elements, coarse mineral particles can also take over the drainage function (see page 12).

Bauder SDF mat - budget drainage system



1 Planting

Hydro sowing - Bauder spray planting or planting with Bauder low-growing shrubs.

2 Vegetation layer

Bauder extensive plant compost, a mixture of coarse mineral particles with small quantities of an organic substance for extensive planting in multi-layer constructions in accordance with FLL guidelines, complete with test certificate. Installation thickness 8 cm.

3 Protective, drainage and filter layer

Bauder SDF mat, protective, drainage and filter mat in extruded polypropylene monofilaments, with a protective non-woven fabric layer underneath, a filter non-woven fabric layer on top and the layers overlapped at the side, thickness 20 mm.

4 Separating and sliding layer

Bauder separating film PE 02, bitumen and polystyrene-resistant polyethylene film made from recycled granulate. Thickness 0.2 mm.

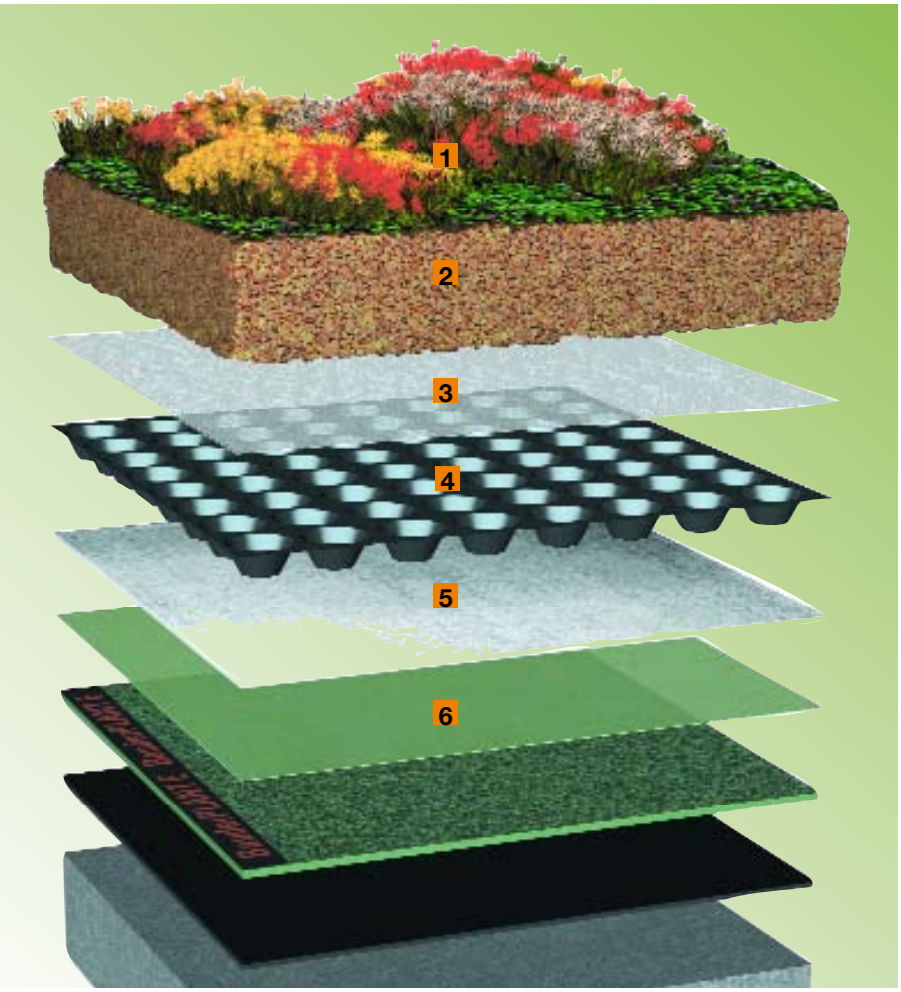
Technical data

Roof angle 1° - 5°
If the angle is 0°, specific advice for the building is needed

Construction height	10,0 cm
Water storage capacity	38 l/m
Weights per unit area (all figures with max. water capacity)	
Separating film*	0,2 kg/m^2
SDF mat	1,0 kg/m^2
Plant compost R-E, installation thickness 8 cm	100,0 kg/m^2
Vegetation in accordance with FLL	10,0 kg/m^2
Total weight	111,2 kg/m^2

*separating film not needed from a 3° roof angle

Bauder drainage and storage element N 20 – drainage that will withstand pressure



Technical data

Roof angle 1° - 5°
If the angle is 0°, specific advice for the building is needed

Construction height	10,0 cm
Water storage capacity	45 l/m
Weights per unit area (all figures with max. water capacity)	
Separating film*	0,2 kg/m²
Protective non-woven fabric W 300	2,6 kg/m²
Drainage and storage element N 20	7,0 kg/m²
Filter layer	0,2 kg/m²
Plant compost R-E, installation thickness 8 cm	100,0 kg/m²
Vegetation in accordance with FLL	10,0 kg/m²
Total weight	120,0 kg/m²

*separating film not needed from a 3° roof angle

1 Planting

Hydro sowing – Bauder spray planting or planting with Bauder low-growing shrubs.

2 Vegetation layer

Bauder Extensive plant compost, a mixture of coarse mineral particles with small quantities of an organic substance for extensive planting in multi-layer constructions in accordance with FLL guidelines, complete with test certificate. Installation thickness 8 cm.

3 Filter layer

Bauder non-woven filter fabric, staple fibre non-woven fabric from needle-punched polypropylene. Weight per unit area 105 g/m².

4 Water storage and drainage layer

Bauder drainage and storage element N 20, HDPE drainage element that will withstand pressure, tuft height 20 mm, water storage capacity 6 l/m², pressure resistance 150 kN/m².

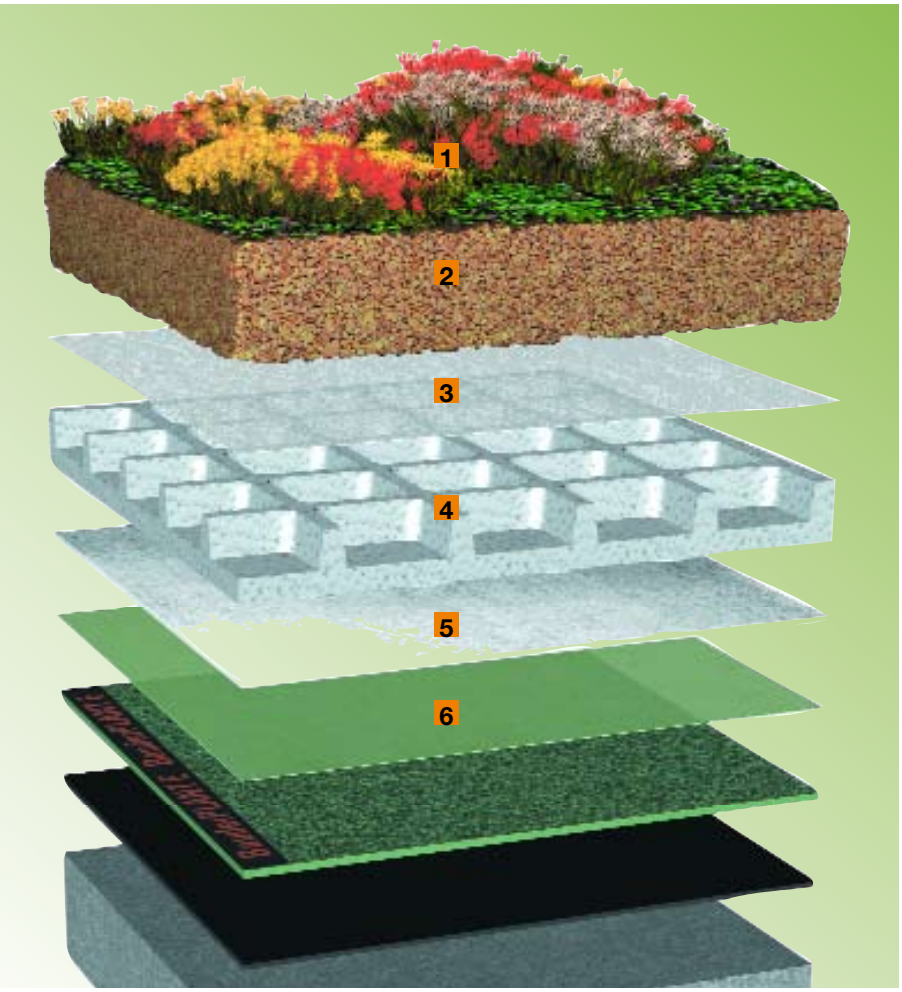
5 Protective layer

Bauder protective non-woven fabric W 300, mechanically and thermally bonded recycled fabric from PES and PP regenerate, weight per unit area 300 g/m², water storage capacity 2.3 l/m².

6 Separating and sliding layer

Bauder separating film PE 02, bitumen and polystyrene-resistant polyethylene film made from recycled granulate, thickness 0.2 mm.

Bauder water storage panel – the sophisticated planting method



Technical data

Roof angle 0° - 5°

Construction height	13,0 cm
Water storage capacity	50 l/m
Weights per unit area (all figures with max. water capacity)	
Separating film*	0,2 kg/m²
Protective non-woven fabric W 300	2,6 kg/m²
50 mm water storage panel	11,0 kg/m²
Filter layer	0,2 kg/m²
Plant compost R-E, installation thickness 8 cm	100,0 kg/m²
Vegetation in accordance with FLL	10,0 kg/m²
Total weight	124,0 kg/m²

*separating film not needed from a 3° roof angle

1 Planting

Hydro sowing – Bauder spray planting or planting with Bauder low-growing shrubs.

2 Vegetation layer

Bauder plant compost R-E, a mixture of coarse mineral particles with small quantities of an organic substance for extensive planting in multi-layer constructions in accordance with FLL guidelines. Installation thickness 8 cm.

3 Filter layer

Bauder non-woven filter fabric, staple fibre non-woven fabric from needle-punched polypropylene. Weight per unit area 105 g/m².

4 Water storage and drainage layer

Bauder 50 mm water storage panel in rigid polystyrene foam with recycled constituents and profiled underside. Water storage capacity 10 l/m², element height 50 mm.

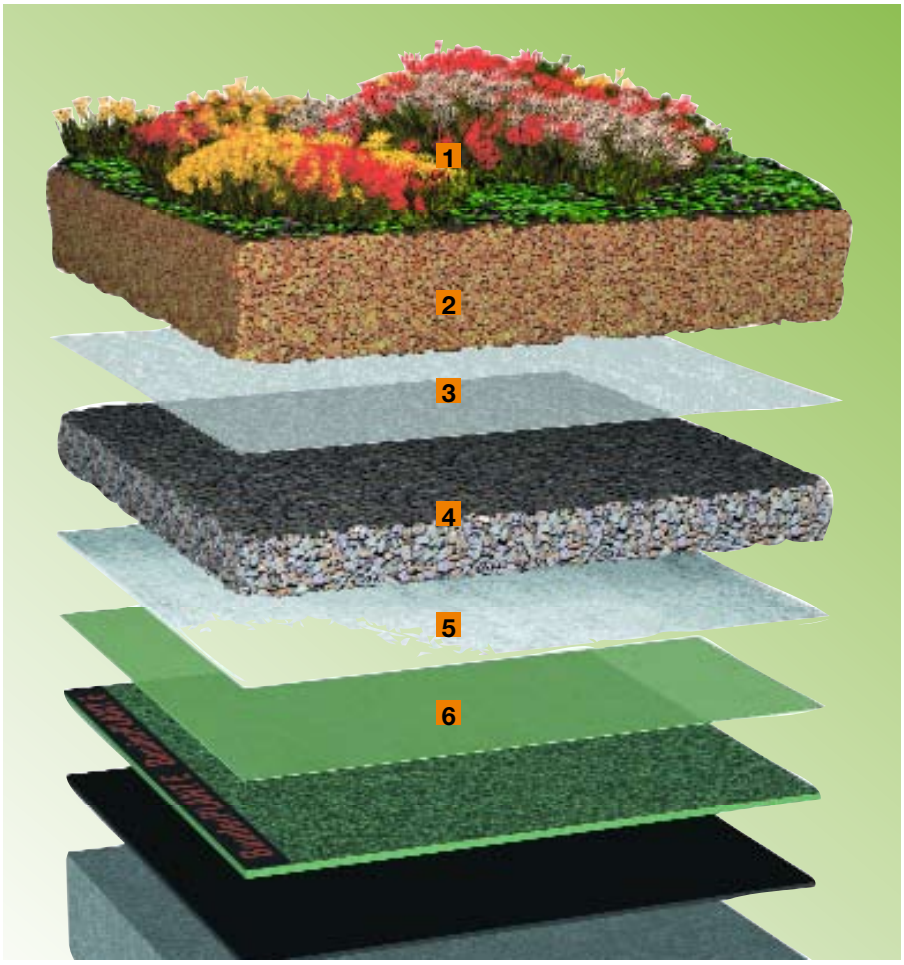
5 Protective layer

Bauder protective non-woven fabric W 300, mechanically and thermally bonded recycled fabric from PES and PP regenerate, weight per unit area 300 g/m², water storage capacity 2.3 l/m².

6 Separating and sliding layer

Bauder separating film PE 02, bitumen and polystyrene-resistant polyethylene film made from recycled granulate, thickness 0.2 mm.

Bauder mineral drain – coarse mineral particles



Technical data

Roof angle 0° - 5°	
Construction height	13,0 cm
Water storage capacity	50 l/m
Weights per unit area (all figures with max. water capacity)	
Separating film*	0,2 kg/m²
Protective non-woven fabric W 300	2,6 kg/m²
Mineral drain L2/11, installation thickness 5 cm	52.5 kg/m²
Filter layer	0,2 kg/m²
Plant compost R-E, installation thickness 5 cm	60,0 kg/m²
Vegetation in accordance with FLL	10,0 kg/m²
Total weight	125,5 kg/m²

*separating film not needed from a 3° roof angle

1 Planting

Hydro sowing – Bauder spray planting or planting with Bauder low-growing shrubs.

2 Vegetation layer

Bauder Extensive plant compost, a mixture of coarse mineral particles with small quantities of an organic substance for extensive planting in multi-layer constructions in accordance with FLL guidelines, complete with test certificate. Installation thickness 5 cm.

3 Filter layer

Bauder non-woven filter fabric, staple fibre non-woven fabric from needle-punched polypropylene. Weight per unit area 105 g/m².

4 Water storage and drainage layer

Bauder mineral drain, coarse mineral drainage particles in accordance with FLL, installation thickness 5 cm.

5 Protective layer

Bauder protective non-woven fabric W 300, mechanically and thermally bonded recycled fabric from PES and PP regenerate, weight per unit area 300 g/m², water storage capacity 2.3 l/m².

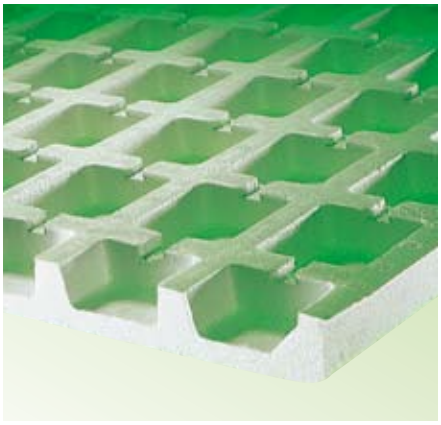
6 Separating and sliding layer

Bauder separating film PE 02, bitumen and polystyrene-resistant polyethylene film made from recycled granulate, thickness 0.2 mm.

Extensive planting for roof constructions with reduced load bearing capacity

With the Bauder light green roof system, roof constructions with reduced load bearing capacity can also be planted.

Light roof constructions are not only prevalent in industrial and commercial buildings these days. These roof constructions only have small load margins as a rule.
With a water-saturated weight of more than 100 kg/m², it is often no longer possible to use the standard system constructions. The system construction with the Bauder water storage panel has been specially developed for this application. The high storage capacity of the water storage panel allows an installation thickness of the vegetation layer that is reduced to 5 cm. Together with a low-weight vegetation substrate – Bauder plant compost PO-E – the weight per unit area of the total construction is just 66 kg/m² in the water-saturated state.



Bauder water storage panel with light substrate – planting system for trapezoidal sheet roofs

Technical data

Roof angle 0° - 5°	
Construction height	10,0 cm
Water storage capacity	29 l/m
Weights per unit area (all figures with max. water capacity)	
50 mm water storage panel	11,0 kg/m²
Filter layer	0,2 kg/m²
Plant compost PO-E, installation thickness 5 cm	55,0 kg/m²
Total weight	66,2 kg/m²

*Total weight incl. vegetation approx. 70 kg/m²

1 Planting

Hydro sowing – Bauder spray planting or planting with Bauder low-growing shrubs. Because of an installation thickness of the vegetation substrate of just 5 cm, the diameter of the shrub must not exceed 4 cm.

2 Vegetation layer

Bauder plant compost PO-E, a mixture of coarse mineral particles with small quantities of an organic substance for extensive planting in multi-layer constructions in accordance with FLL guidelines. Installation thickness 5 cm.

3 Filter layer

Bauder non-woven filter fabric, staple fibre non-woven fabric from needle-punched polypropylene. Weight per unit area 105 g/m².

4 Water storage and drainage layer

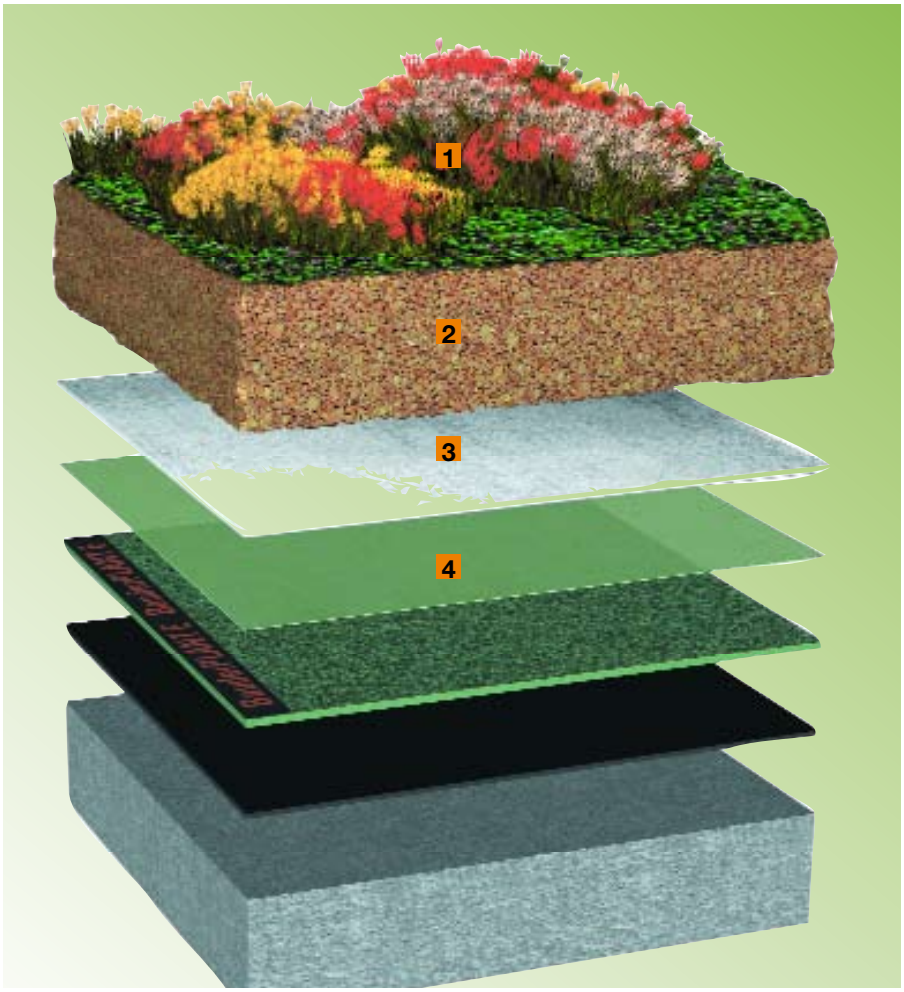
Bauder 50 mm water storage panel in rigid polystyrene foam with recycled constituents and profile on the underside. Water storage capacity 10 l/m², element height 50 mm.

Extensive planting for large roof areas

With extensive planting over a wide area, a multi-layer construction is, as a rule, too complicated.

The mono-layer construction has proved successful here as a reasonable compromise in terms of cost and result. The mono-layer construction allows large areas to be planted in a short time and at low cost. With this extremely simple type of construction, a homogenous layer of the Bauder mineral plant substrate takes over the functions of drainage, filter and vegetation layer. The mono-layer construction makes particularly high demands on the quality of the vegetation substrates used. All three functions – drainage, filtering and plant growth – take place in a single layer. Hardly any other manufacturer has paid as much attention to these particular features of the mono-layer construction as Bauder. The Bauder mono-layer substrates incorporate the experience of many years of successful mono-layer planting.

Bauder plant substrate – the budget solution



Technical data

Roof angle 1° - 10°	
Construction height	10,0 cm
Water storage capacity	29 l/m
Weights per unit area (all figures with max. water capacity)	
Separating film*	0,2 kg/m²
Protective non-woven fabric W 300	2,6 kg/m²
Plant compost R, installation thickness 10 cm	110,0 kg/m²
Vegetation in accordance with FLL	10,0 kg/m²
Total weight	122,8 kg/m²

*separating film not needed from a 3° roof angle

Roof angle 1°- 3°

1 Planting

Hydro sowing – Bauder spray planting or planting with Bauder low-growing shrubs.

2 Vegetation, filter and drainage layer

Bauder plant substrate, a mixture of coarse mineral particles for extensive planting in mono-layer constructions in accordance with FLL guidelines, complete with test certificate. Installation thickness 10 cm.

3 Protective layer

Bauder protective non-woven fabric W 300, mechanically and thermally bonded recycled fabric from PES and PP regenerate, weight per unit area 300 g/m2, water storage capacity 2.3 l/m2.

4 Separating and sliding layer

Bauder separating film PE 02, bitumen and polystyrene-resistant polyethylene film made from recycled granulate, thickness 0.2 mm.

Roof angle 3°- 10°

The separating and sliding layer is not required from a roof angle of 3°.
In order to counter the increased surface run-off, plant compost with a greater storage capacity is used instead of plant substrate. The protective non-woven fabric W600 acts as an additional water storage element.

Extensive system planting

HÄMMERLE PLANTING SYSTEMS
- Systems for extensive and intensive roof planting
- Bauder spray planting

Net green area ≥ 150 m²

The Bauder spray planting method uses special machines to make a liquid mixture of various additives, sedum shoots and/or seeds, which is then sprayed on to the vegetation substrate mechanically in a single operation. This makes the Bauder spray planting method the most efficient way for the extensive planting of large roof areas.
Two types of spray planting systems are available – the hydro sowing of pure sedum shoots or combined with wild flowers and wild herb seeds.

Planting with Bauder low-growing shrubs

Net green < 150 m²

Spray planting is not economical for planting areas of less than 150 m². The best method for planting small areas is to plant low-growing shrubs. The shrubs are mainly nurtured and stress-conditioned in a mineral substrate.

Standard assortments are available for different locations (sun, shade, semi-shade).
Shrubs with a 5 – 6 cm diameter should be planted at the rate of 12/m².

Bauder follow-up care – only in conjunction with hydro sowing

Extensive planting is low maintenance – but not maintenance-free. To guarantee successful planting, follow-up care is essential.

Follow-up care measures include:

- re-sowing bare patches with seed or sedum shoots
- controlled nutrient feed as required
- removal of weeds.

In addition to this vegetation care, the follow-up care also includes checking and cleaning the roof drains.

The follow-up care ends when acceptance status is reached – usually after 12 – 18 months.

Without a follow-up care order, we only guarantee our professional spray planting work and the use of problem-free additives.

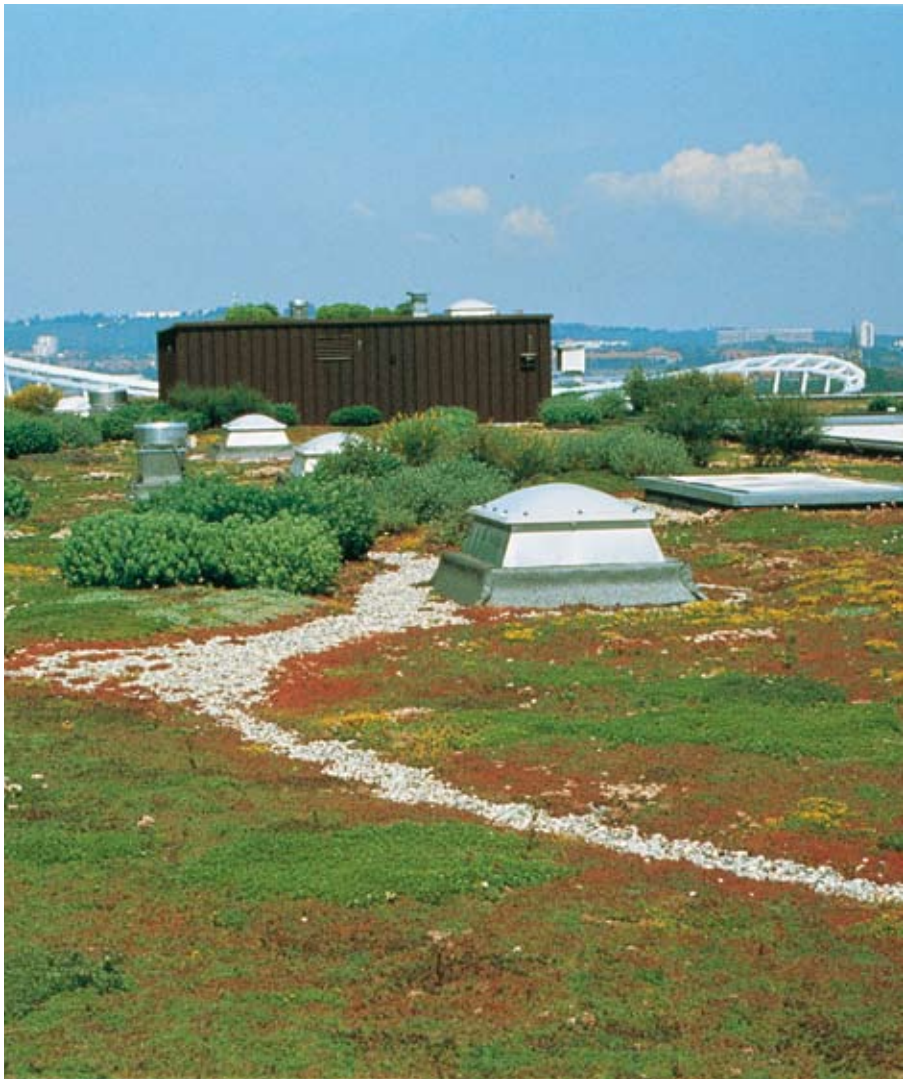
The main acceptance criteria are:

- there must be a uniform plant stock with a projective cover of at least 60%. The cover does not include asexual and extraneous vegetation, which must not exceed 20%.
- Before acceptance, the vegetation should have survived a rest period and also a drought or frost period if possible.

Bauder development and maintenance care

At the end of the follow-up care period, a care and maintenance agreement should be signed, at least for the duration of the guarantee. As part of the development and maintenance care, the roof areas will be checked during one to two inspection visits a year and, if necessary, the follow-up care measures will be continued, but, as a rule, less intensely.

The permanent function of the roof planting can only be guaranteed by a continuing development and maintenance care contract.



Installation thicknesses

The installation thicknesses specified for the individual constructions are based on the requirements relating to sedum/grass/herb vegetation.

If only sedum is planted, the installation thicknesses of the vegetation layer can be reduced by approx. 2 cm, so that in the case of the construction with the Bauder SDF mat, a 6 cm (rather than 8 cm) layer of plant compost R-E is sufficient.

In the case of a mono-layer construction with sedum planting, the installation thickness can be reduced correspondingly to 8 cm. Any further reduction in the installation thickness places the permanent function guarantee of the roof planting at risk.

Please also see our information brochures on intensive and steep roof planting.

Green roofs are just one of the many facets of Bauder's competence.
We also offer the highest quality and expert knowledge in flat roof and pitched roof seals – including heat insulation and all the other protective functions required.

BAUDER

Werk Stuttgart
Paul Bauder GmbH & Co. KG
Korntaler Landstraße 63
D-70499 Stuttgart
Telefon 0711/88 07-0
Telefax 0711/88 07-300
stuttgart@bauder.de
www.bauder.de

0910/0407 GB DW