



GREEN AND PROTECTED SYSTEMS



Protan solutions

Protan is Scandinavia's largest manufacturer of thermoplastic roofing materials and is at the forefront of membrane technology.

Protan (UK) Ltd offers a range of durable PVC single-ply membranes, which offer the flexibility of design required for modern roofing systems. More than 70,000,000m² of Protan membranes have been installed throughout Europe since 1971 and our oldest roofs continue to be fully-functional today.

Protan's protected membranes are used in green and protected systems in cold, inverted and warm roof constructions. The advantages include:

- Improved fire protection
- Improves the building's acoustic and thermal performance
- Protection from the effects of rapid temperature changes
- Useable roof area

PROTAN GREEN ROOF SYSTEM

The Protan Green roof system has benefitted from over 30 years of green roofing experience by our Norwegian parent company, Protan AS. The partnerships that we have developed in the UK allow Protan (UK) Ltd to offer some of the simplest, technically robust, versatile green roof systems available in the marketplace.

Suitable for new-build and refurbishment projects, the Protan Green roof system can be installed on roofs of any size, from large, commercial projects to domestic buildings.

PROTAN PROTECTED SYSTEM

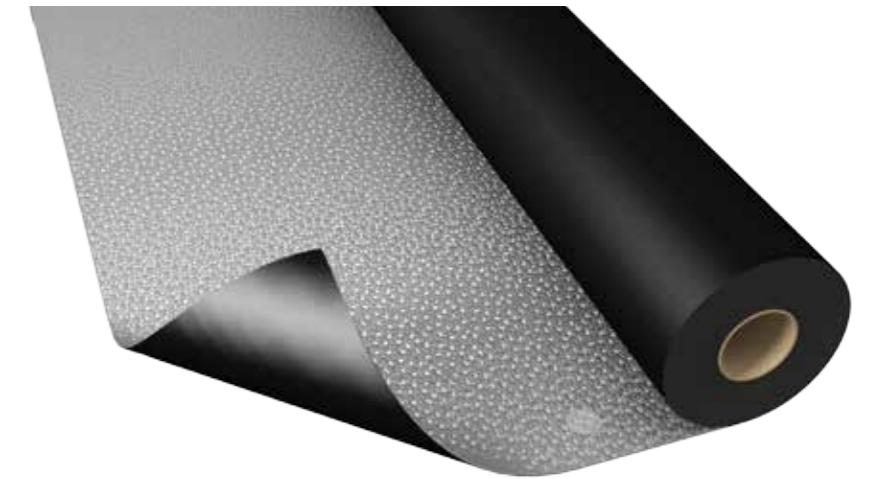
The use of concrete paving or gravel has always been a popular choice for roofs and can increase the usability of a building by providing extra living space for the building's occupants.



Protan G membranes

Protan G and prefabricated Protan G PVC single-ply membranes offer the perfect solution to green and protected systems for a number of reasons:

- Can be loose-laid for quick installation (minimum dry ballast weight $\geq 80\text{kg/m}^2$)
- FLL accredited
- Fully-compatible with other Protan PVC single-ply membranes
- Manufactured with anti-fungicides to resist microbial attack
- Reinforced with glass fibre for dimensional stability
- Resistant to foot traffic during installation



Design considerations

When designing a green or protected roof, the roof design should take the following into account:

- How will it be used?
- Extreme wind loads
- Membrane protection for areas of high foot traffic
- Planning restrictions
- Roof pitch
- Technical restrictions eg. structural roof deck and dead/snow loads

Protan technical support

Protan (UK) Ltd provides a complete service from conception to completion. The earlier we are involved in a project, the more assistance we can provide. This service is delivered by our highly experienced in-house technical services department and our contact horticulturalists who install and advise on the green elements on our behalf.

Protan's technical support includes on-going site inspections to ensure that our PVC single-ply membranes are installed to our stringent guidelines by an approved partner roofing contractor, all of whom are trained to the highest standards in our training facility. This ensures that your roof will remain watertight for the length of the warranty and beyond. Warranty lengths range from 10 to 20 years, depending upon the construction.

Protan data sheets and standard detail drawings can be obtained from Protan.

A brief introduction to green roofs

Green roofs are increasing in popularity in the UK for aesthetic, environmental and recreational reasons. Protan's green roof systems offer significant benefits to the building's performance and the environment.

The Protan Green roof system can accommodate a range of planting schemes, all of which meet strict FLL guidelines:

- Bio-diverse
- Extensive
- Intensive
- Turf

FLL GUIDELINES

The FLL has been working on standards for green roofing technology for over 25 years. For many years, these guidelines have been the only source of reliable information for green roof designers. Their *Guidance for Planning, Execution and Upkeep of Green-Roof Sites* reflects the acknowledged, state-of-the-art technology.

Although the guidelines do not give solutions for all green roof problems, they have become the recognised industry standard for the construction of high-quality and reliable green roofs.

SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS)

SUDS is becoming increasingly important in terms of planning. Its aim is to ensure that rainfall is managed across all areas of construction, particularly on roofs.

The green roof's sedum or wildflower mat and growing medium soaks up the rainwater, thereby significantly reducing run-off and consequently reducing the risk of flooding. The rainwater is filtered naturally through the green roof system build-up and is released slowly back into the watercourse at ground level.

All of Protan's green roof systems conform to the SUDS requirements, particularly the turf green roof system, which has a minimum growing medium depth of 170mm.

The deeper the system, the better it performs.

PROTAN G MEMBRANE

Protan G membrane was developed specifically for green roof systems (excluding intensive green roof systems, which use Protan GG membrane).

Protan G membrane can be loose-laid in a green roof system, with the following exceptions:

- The dry ballast weight is <math><80\text{kg/m}^2</math>
- The membrane is to be left exposed for period of time prior to the installation of the green roof elements
- The roof pitch is >math>15^\circ</math>

Accredited to FLL testing on root resistance, Protan G membrane offers a fast and safe way to cover large roof areas without the use of adhesives, which ensures that the roof system is fully-recyclable at the end of its working life.



Protan extensive green roof system

Extensive planting schemes are designed to provide a low-maintenance vegetation landscape that is drought-, frost- and wind-resistant.

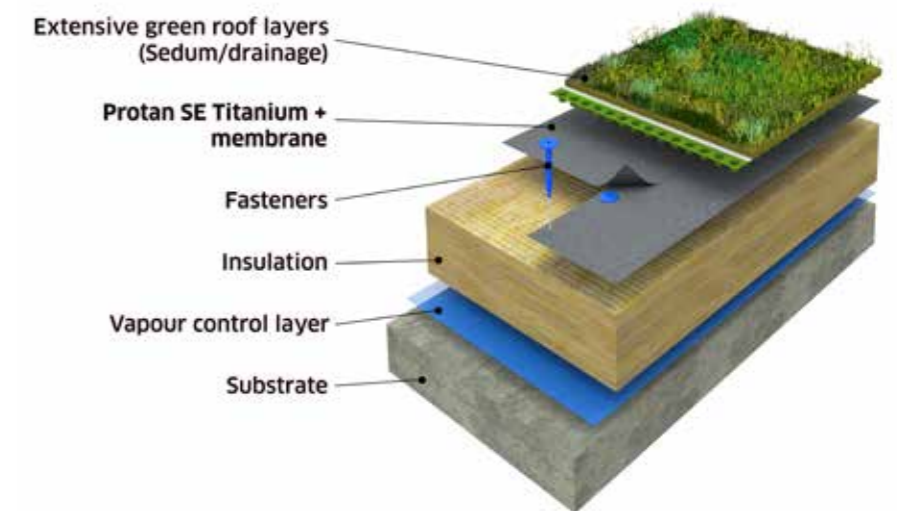
Sedum blankets provide instant greening, giving an instantly attractive and colourful green roof.

The alternative is to scatter sedum sprouts and cuttings over the growing medium on site. This is a more economical solution that is equally effective in the long term.

The sedum blanket is laid on 70mm deep (minimum) growing medium, which is the recommended depth for a healthy, self-sustaining sedum roof.

An extensive planting scheme is ideal for a number of applications:

- Helping to achieve SUDS requirements
- Low maintenance solutions
- New builds
- Can be beneficial when seeking planning permission



Protan turf green roof system

Traditionally, turf roofs have been used in Scandinavia for centuries as a means of insulation and roof support. Suitable for timber frame constructions with a pitched roof, they are ideal for commercial and residential applications where integration of local bio-diversity is desirable.

The Protan Turf Green Roof system utilises a bio-diverse planting scheme made up of species native to the UK, allowing rural buildings to blend into their natural surroundings, or soften the urban landscape.

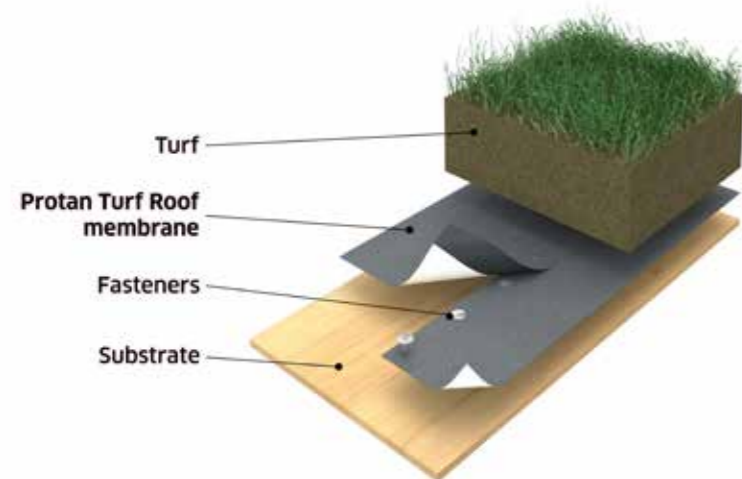
Turf roofs can be installed on almost all roof pitches, a unique feature of this system. It can also offer:

- A range of finishing options
- Excellent SUDS benefits with nearly 200mm of living material
- Increased acoustic and thermal benefits
- Local bio-diversity benefits
- Simple installation, making it very cost effective due to labour savings
- Survival in extreme weather conditions

This system is one of the simplest and quickest to install in the marketplace. The 150mm of growing medium is supplied in hessian bags and installed like brickwork up the slope. A 20mm screed of soil is then applied to level out the system, then the wildflower turf mats are installed on top.

Ideal for:

- Almost all roof pitches
- Commercial applications
- Domestic applications
- Timber frame buildings



Protan ballasted protected system

Protected roofs are becoming increasingly popular as people strive to increase the usability of their building.

For the Protan Protected system, Protan developed Protan G membrane, which can be loose-laid onto the substrate or insulation. This allows:

- Easy retrofitting of existing buildings
- Fully recyclable membrane at the end of its working life, as no adhesives are used
- Installation in a wide variety of temperature and weather conditions
- Mechanical fixings to be reserved for the roof perimeter and penetrations
- Speedy installation, providing a watertight structure quickly

GRAVEL BALLASTED ROOFS

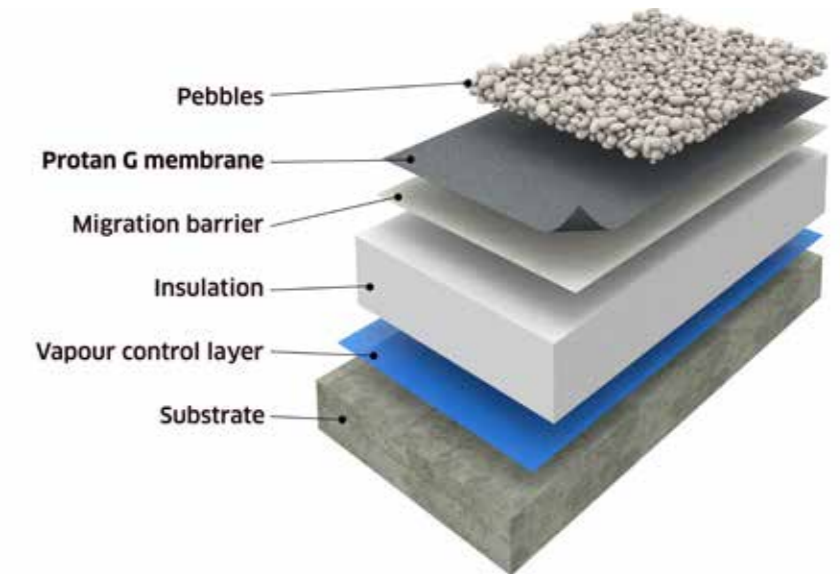
20-40mm round gravel ballast can be selected for aesthetics, improved fire performance and wind uplift resistance, as well as affording extra protection for the membrane

RECREATIONAL PAVED ROOFING

Paving slabs are selected for recreational purposes and allow the roof to be easily used by the building's occupants.

BROWN ROOFS

Brown roofs are used to help local bio-diversity, supporting rare species of plants and animals. They are created by covering roofs with a layer of locally-sourced material, or a mixture of brick and concrete rubble is used and left to self-colonise.





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