Innovative Green Roof Systems

Roof gardens from a waterproofing perspective
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Atab has many years of experience and specialised knowledge of the roofing industry, in terms of both recommending and manufacturing components for proven durable roofing systems as well as in the field of thermal insulation. The IKOgreen system has been specially developed on this basis for use in green roof applications.

The comprehensive product range developed within the IKOgreen system for green roofs is being constantly adapted to the changing requirements of designers and the ever-changing regulations and new industrial standards.

Architects, owners and developers of buildings, as well as the parties carrying out the work such as building contractors and roofing companies, but also design consultants for infrastructure, hard and soft landscaping also need to allow for the fact that the roofing structure must be designed to be capable of functioning at its optimum in the IKOgreen system. You can therefore rely on the technical expertise delivered by Atab, for both new-build and refurbishment projects.

Waterproofing – at the heart of every roof garden

The foundation for any successful roof garden is a mechanically strong, but most of all root-resistant roofing system. Selecting a product you can rely on is of essential importance for continued enjoyment of a trouble-free planted roof system in the long term too.

Atab has long-standing experience in the manufacture of, but also acting in an advisory capacity for, roofing materials which are eminently suitable for roofing systems under roof gardens. This experience has been gained in new-build projects as well as refurbishment works. In addition, Atab has built up long-term relationships with architects, principals and contractors, in both the public and the private sector.

In order to incorporate a properly functioning roof garden in a project, in addition to suitable roof cladding, high quality planting components are required. Our roof garden systems consist not only of a comprehensive range of materials for root protection, resistance to fire spread, drainage, water retention and planting substrates, but also of a variety of plants and accessories for the various applications.
The ideal green roof is the Polygum *prevENt* roof

Long-lasting and securely waterproof, fireproof and root-resistant

**Polygum**

Highest efficiency with hard foam PIR insulation

**IKO**

**prevENt**

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**Roofing membranes:**
- Proven durability + 30 years
- Root-resistant membrane for green roofs, FII-tested
- 4 European fire standards resistance to flying embers, Broof (t1-t4)
- *prevENt* graphite technology, best protection against flying embers and secondary burning effects
- Installation at Turbo speed
- Dimensional stability because trilaminate polyester-composite reinforcement
- No blistering because of self adhered underlayer with built-in vapour diffusion Quadra Rock KSK

**Insulation:**
- Highest efficiency per m²
  - Lambda up to 0.023W/mK
  - Reduced thickness and weight
  - EPB standard
  - Fire-resistant because PIR doesn’t irritate the skin, doesn’t melt
  - Lighweight but dimensionally stable
  - Durable
  - Tread sure
  - High compressive strength
  - Moisture resistance because of closed cell structure

**The system:**
- Two layer, fire safe roofing system, waterproof in one single operation
  - Waterproof with self-adhesive vapour screen and underlayer
  - Insulation is not damaged and no distortion because no-flame application
  - Fast, fire safe installation
  - No waiting time
  - All roof structures
  - For all interior climate classes
  - Free comprehensive Insurance-Backed Guarantee

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* Only Polygum *prevENt* Turbo 250 has the benefit of a comprehensive Insurance-Backed guarantee subject to being installed by an Authorised Polygum roofer in accordance with Atab instructions and after inspection by an independent inspection agency.
Polygum roof engineering: comprehensive quality concept for Polygum prevENt roofs

The extent of difficulty in designing and building functional, aesthetic and technically sound roofing systems has increased sharply in recent years and demands quality to be monitored in all phases of the construction process.

It is for this very reason that ATAB nv has developed the comprehensing Polygum Roof Engineering® quality concept.

The right roof cladding
Proven lifespan
Polygum roof waterproofing applied as described in this roof engineering package and given annual maintenance has a proven lifespan of 30 years.

The Polygum prevENt roof concept
Roof garden finisher, once installed, can make it very difficult to identify and repair leaks in a waterproofing membrane. That’s why it is important to get the whole system right first time. And that’s why the Polygum prevENt roof is the right choice.

The right roofing system
Specification service for new build as well as refurbishment
Having studied the project thoroughly, with all the requisite calculations, such as dew point and wind load calculations, we will draw up the schedule of requirements. This will enable you to place a quotation with the Authorised Polygum roofing contractor of your choice. The specification service is backed up by the Polygum website, which provides user-friendly access to roofing systems and specification texts.

Roofing inspection, surveys and product analysis for renovation
In response to a simple request we will analyse the existing roof system, which will enable you to carry out proper refurbishment in a professional manner. Systematic roof inspection significantly increases the expected lifespan of a flat roof.

Correct installation
Authorised roofing contractors
Our aim is integrated quality assurance for your projects, which leads us to set stringent requirements for the selection of Authorised Polygum Roofing Contractors.

Training for roofing professionals
ATAB attaches a great deal of importance to continuous training of its partners. The Polygum Training Centre is an ideal forum, especially for principals, specifiers and roofing contractors to perfect their roofing knowledge.

Project guidance and monitoring
Our independent staff provide guidance for all of the construction partners involved, in all phases of the construction process, i.e. starting from specification phase up to and including project completion and after-care.

COMPREHENSIVE 10-year Insurance-Backed Guarantee
This comprehensive insurance-backed guarantee, in conjunction with the above service package, ensures the longevity and the security of your roofing materials. The entire roof is guaranteed against leakage, including unexpected leakage due to performance defects. Given the fact that we control the roof during its installation, we also guarantee the products and the manufacturing. The fact that the right to compensation remains valid for 10 years and is guaranteed under any circumstances represents added security for the owner. Such type of guarantee is unequalled.
Polygum prevENt Turbo 250 (Broof t1-t4)

**Root-resistant top layer with FLL approval**

Polygum prevENt Turbo 250 Broof (t1-t4) has been tested at the German specialist institute for horticultural development FLL “Forschungsgesellschaft für Landschaftsentwicklung und Landschaftsbau e.V.” in Geisenheim over a period of 4 years and has withstood the severest tests. Polygum prevENt Turbo 250 Broof (t1-t4) can be used under roof gardens without any problems.

**Fire-resistant graphite technology: prevENt**

Polygum prevENt is a thoroughly researched fire-resistant design. Its unique patented graphite technology makes a Polygum prevENt roof the best protection against flying embers. In the event of a fire the graphite expands by up to as much as 300%, as a result of which it forms a sealed carbon layer over the bitumen. This cuts off the oxygen supply to the flames thus extinguishing the fire. Hence with this high-quality roof there will be no restrictions on the intended use of the building or any subsequent change of use.

**High-grade tri-polymer bitumen with a wide bonding window**

Polygum prevENt Turbo Turbo 250 Broof (t1-t4) consists of a unique tri-polymer bitumen mixture, which is made up of 3 monomers.

The right composition of various complementary monomers provides a higher grade of coating than that normally used in standard roofing systems.

This high-grade bitumen provides the roofing material with exceptional bonding strength and thanks to its plasticity remains easily workable even at extreme temperatures. Furthermore, physical properties, such as tensile and nail tear strength are far above the norm.

**Resistant to water under pressure**

Polygum prevENt complies with the severe 4 bar water pressure test. The combination of high-grade tri-polymer and 250 g/m² composite reinforcement enables Polygum prevENt to withstand water at a pressure of 4 bar without any problems. This is equivalent to a 40 m column of water! This has the added benefit of making the roofing material perfectly usable for roof gardens, terraces, roof paving, etc.

**Tri-laminate with prevENt technology**

1. Anthracite granule top layer
2. Modified tri-polymer bitumen, root resistant
3. Tri-laminate polyester composite reinforcement
   - tri-laminate polyester fibres
   - mesh of fibreglass threads lengthwise and additional reinforced polyester threads across the width
   - tri-laminate polyester fibres
4. Modified tri-polymer bitumen
5. Torching film with Roof Engineering design
6. Expandable natural graphite crystals - prevENt®

**PrevENt tri-laminate polyester composite inlay**

A slightly heavier 250 g/m² roofing material was decided on for this state-of-the-art roofing material, but without its disadvantages such as capillary action through the lateral and end-laps.

**4 European standards**

Polygum prevENt roof complies with the 4 European standards and tests on resistance to flying embers in conformance with EN13501-part 5 class Broof (t1-t4) following tests according to ENV1187.
Possibilities with planted roofs

Extensive roof planting
These systems feature plants requiring low maintenance. A low build-up in the form of a planting substrate is sufficient for them. Sedum plants which may be supplemented with decorative grasses and herbs, will provide optimum protection for the roofing system. In addition, these systems have aesthetic value and a water retention capability. A well-designed system contributes to improving the roof’s acoustic and thermal performance.

Intensive roof planting or roof gardens
These systems feature a lawn and/or plants requiring regular maintenance. The variations on this theme are virtually unlimited enabling you to create a beautiful garden at rooftop level. The package height is increased substantially and the function of an effective drainage system is essential here. Bushes, trees and shrubs can be planted along with groundcover plants. The system which has been designed is only restricted in terms of maximum permissible loading.

Multifunctional use roofs
These roofs feature intensive roof planting combined with roof paving. All kinds of combinations are now possible: intensive roof planting combined with play facilities or footpaths or with vehicular traffic. The creative spirit can be allowed free rein. Loadings are considerably higher with vehicular traffic, needing to be allowed for at the design stage.
### Tailored roof garden systems

#### Extensive roof gardens

<table>
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<th>Applications</th>
<th>Materials</th>
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| • Roof slope up to 26.8% warm roof or inverted roof | • Sedum shots or plug plants extensive substrate approx. 6 to 8 cm (including 15% settlement) 
• Roof slope up to 15°-30° warm roof only | • Vegetation with sedum plants extensive substrate approx. 8 cm  
• IKOgreen drain and 4+1 water reservoir filtration, drainage, separation and protection  
• IKOgreen Polygum prevEEn roof  
- Polygum prevEEn Turbo 250 Broof (t1 - t4)  
- Quadra Rock KSK self-adhesive underlayer  
- Thermal insulation, IKO Enertherm; PIR insulation for warm roof system  
- Turbo Stick aluminium self-adhesive vapour barrier  
- Concrete base |
| • Roof slope > 30° upon request only | (1) By plug plants 8-12 cm substrate |

#### Intensive roof gardens

<table>
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<tr>
<th>Applications</th>
<th>Materials</th>
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| • Roof slope up to 5% warm roof or inverted roof  
• Planting combined with footpaths possible | • Shrubs, bushes and trees or lawn (grass roof)  
• Intensive substrate approx. 20 cm for grass roofs or thickness dependent upon type of plants selected  
• IKOgreen drain and 4+1 water reservoir, MSP50 IKOgreen 40 litre/m²  
• IKOgreen Polygum prevEEn roof  
- Polygum prevEEn Turbo 250 Broof (t1 - t4)  
- Quadra Rock KSK self-adhesive underlayer  
- Thermal insulation, IKO Enertherm; PIR insulation for warm roof system  
- Turbo Stick aluminium self-adhesive vapour barrier  
- Concrete base |

#### Multifunctional podium deck build-up

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| • Roof slope up to 5% warm roof or inverted roof  
• Paving combined with partial planting  
• Combining with intensively planted roof possible | • Paving (blocks or slabs) stabilised + river RAW sand approx. 3-5 cm foundation layer 0/20 approx. 20 cm IKOgreen drain and 4+1 water reservoir, drainagemat, teracedrain  
• IKOgreen Polygum prevEEn roof  
- Polygum prevEEn Turbo 250 Broof (t1 - t4)  
- Quadra Rock KSK self-adhesive underlayer  
- Thermal insulation, IKO Enertherm; PIR insulation for warm roof system  
- Turbo Stick aluminium self-adhesive vapour barrier  
- Concrete base |
Atab is a Belgian company, and has grown from a market leader in the Benelux to an international company in waterproofing.

Atab’s distinguishing features:

- 100 years experience in waterproofing
- Expertise in roof waterproofing materials
- Expertise in civil engineering
- Expertise in contracting
- 3 ISO 9001: 2000 certificates and VCA safety certificate
- Trendsetter and one of the most important players in the following sectors:
  - Roofing
  - Waterproofing
  - Civil engineering
  - DIY
- Exports to more than 60 countries worldwide
- International certificates and approvals

Atab in the IKO group

- Centre of excellence and European headquarters within the International IKO group.

www.atab.com

IKO setting the standard

- Global headquarters in Toronto, Canada and European headquarters at Atab in Antwerp
- More than 30 plants
- One of the biggest manufacturers of bituminous roofing, waterproofing products and thermal insulation
Features and benefits

**Acoustics**

The improvement in the acoustic values of a roof garden can play an important part in the overall soundproofing of the building. Indicative figures for potential sound reduction can be supplied on request.

**Water retention (reducing storm water run-off)**

The reduction in storm water run-off is of major benefit. It is evident from results of practical tests that the average extensive system is capable of temporarily absorbing around 50% of the rainwater falling on it, and also significantly delay the passage of the remaining water, thus considerably reducing the pressure on drainage facilities and flooding. Intensive systems with sufficient soil depth to support plant life are capable of absorbing and retaining approx. 75% to 90% of rainfall.

**Thermal transmission**

In addition to the thermal insulation installed as part of the waterproofing system, green roofs can further reduce the energy consumption of a building by up to 10%.

**Slope and drainage**

For green roofs, a roof surface with a minimum fall of 1:60 is recommended. Green roofs with a fall below this value is possible, but it does require special drainage facilities.

**Why have green roof systems?**

- Enhances environment;
- Improves the aesthetic appearance;
- Controls storm water run-off into surface water drainage system;
- Reduces noise transmission by upgrading acoustic performance;
- Reduces energy consumption due to better thermal values;
- Improves ambient air quality;
- Increases life expectancy of the water roofing membrane;
- Extensive roofs require little long-term maintenance;
- Intensive roof gardens can be accessed for recreational use.
IKOgreen drainage and 4+1 water reservoir
- Application: plastic drainage sheet with water reservoir and protective layer for intensive and extensive roof planting
- Top: non-woven polypropylene (PP)
- Compression resistant to 72 tonnes per m²
- Raised core: impact-resistant polystyrene (HIPS)
- Bottom: vapour-permeable non-woven polypropylene (PP)
- Thickness: 11 mm
- Compression strength: 700 kN/m²
- Suitable for paving slabs and heavy traffic

IKOgreen water reservoir slabs, MSP50 Heavy
- Application: mineral wool with high water retention capability for intensive roof garden
- Material: rock wool, SG 120 kg/m³
- Capacity: 40 l/m² = 80% by volume
- Dimensions: 100 x 60 x 5 cm
- Dry weight: ≈ 6 kg/m²
- Saturated weight: ≈ 46 kg/m²

IKOgreen sedum cuttings, rooted
- Application: extensive roof garden on flat roofs over substrate or substrate slabs covered with mineral substrate
- Material: mixed 20 mm long cuttings of 5-7 different sedum types
- Supplied in 1 kg bags
- Usage: 50-100 g/m²

IKOgreen plug plants / sedum – herbs – decorative grasses
- Application: extensive roof garden on flat roofs on substrate or in substrate slabs (the latter on sloping roofs as well)
- Supply: by type, 50 plants in slabs
- Usage: minimum of 16 plants per m²

IKOgreen vegetation matting
- Application: extensive roof garden on flat roofs on substrate or substrate slabs (the latter on sloping roofs as well)
- Supply: by type, 50 plants in slabs
- Supply: sedum plants pre-cultivated on cocoa or plastic matting, 5-8 different sedum types per mat
- Size: 3 x 1.20 m

IKOgreen self-adhesive moulding
- Application: Self-adhesive edging moulding in PVC for IKO roof garden system.
- Colour: green
- With Velcro fastening strip
- Section: 5 x 9 cm
- Length: 2.5 m
- 1 set = 25 m

IKOgreen inspection chamber with cover
- Consists of recycled plastic
- Colour: green
- Height: 8 cm
- 10 & 20 cm stacking sections

IKOgreen cutter
- To cut IKOgreen Drain and 4+1 water reservoir and geotextile

IKOgreen spherical wire grille
- Diameter: 80-100 mm
- Prevents drainage matting from sagging
- Guaranteed smooth water discharge

IKOgreen roof substrate, intensive – blown
- Product description: mineral/organic substrate with the following basic components: angelit, olivenit, magnetit, limonit and biotit with organic material (max. 6,5 volume per cent). The mixture is porous and stable in structure. It has good water absorption capacity and sufficient water permeability capability as well as fertiliser buffering capability for good plant development. In accordance with RAL GZ253 approval.
- Application: for all planted areas except acid-loving plants; ‘intensive’ in plant containers; base material for high-grade substrates; soil improving medium in heavier soils; for planting trees
- Density in dry condition: 1,000 kg/m³
- Density at maximum water content: 1,450 kg/m³
- Water/air ratio: at maximum water content: 46% by volume
- Water/air ratio: water permeability mod. K: 0.015 cm/s

IKOgreen roof substrate, extensive – blown
- Product description: mineral/organic substrate with the following basic components: angelit, olivenit, magnetit, limonit and biotit with organic material (organic stofgehalte max. 6,5 volume per cent). The mixture is porous and stable in structure. The extensive substrate has good water absorption capacity and sufficient water permeability as well as fertiliser buffering capability for good plant development. In accordance with RAL GZ253 approval.
- Application: for all extensive planting; base layer for sedums; base material for high-grade substrates; soil improving medium in heavier soils; for planting trees
- Density in dry condition: 950 kg/m³
- Density at maximum water content: 1,380 kg/m³
- Water/air ratio: at maximum water content: 40% by volume
- Water/air ratio: water permeability mod. K: 0.07 cm/s

Supply of growing substrates
- 25 litre bags
- 1 m³ - 1,000 litre Big Bags
- In bulk: 28 m³ (lorry possibly with conveyor)
- Silo lorry, blown per 27 m³ (capabilities upon request)