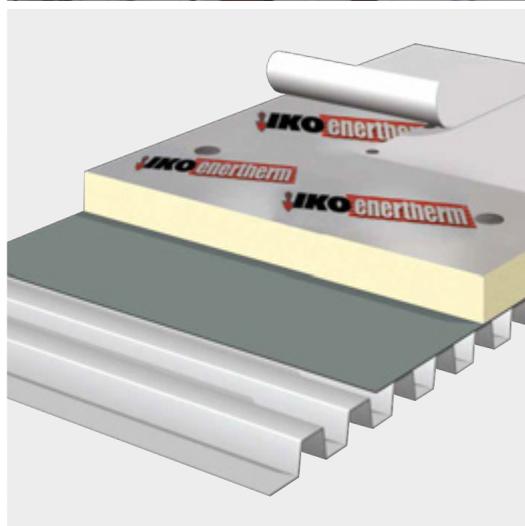
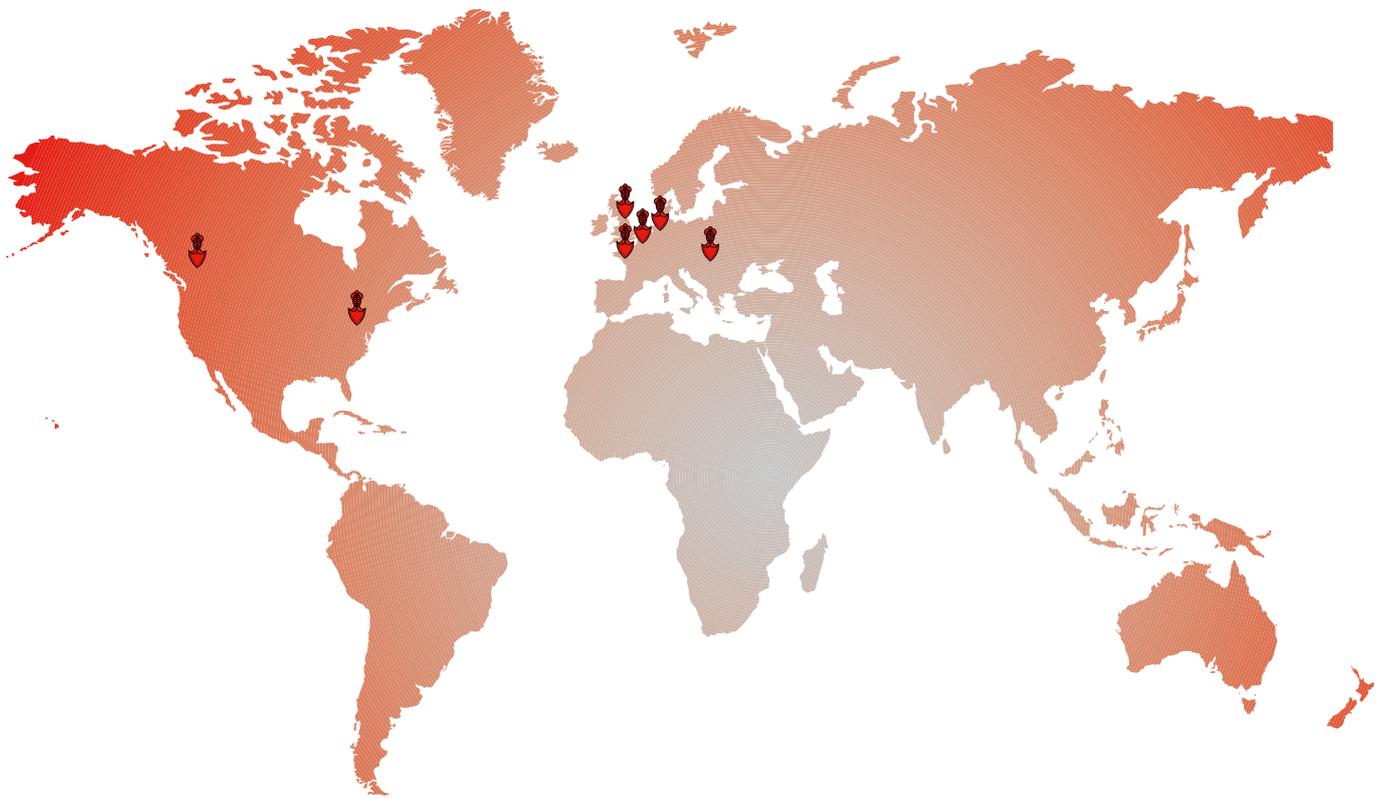


A Specifier's Design Guide to Polymeric Single Ply Roofing



IKO is a **worldwide enterprise**, with more than **3000 employees**, and manufacturing plants in Canada, the United States, United Kingdom, Belgium, Holland, France and Slovakia. The company's operations ship products to **96 countries** around the globe.



The IKO Group

Despite tremendous growth, IKO has also remained firmly rooted in its family values of **entrepreneurial spirit, craftsmanship and innovation**. The company maintains the fierce independence of its founder, and his belief in the importance of controlling the raw materials used in the manufacturing process.

IKO also strives to back the **best products** in the industry with the **best service**. The IKO family includes not just the ownership, but the thousands of dedicated employees across its global operations who share the company's ideals of craftsmanship, attention to detail and world class service for our customers. The commitment of IKO's employees is the key pillar in the company's success in today's competitive marketplace.

The ultimate proof of the company's commitment to quality and innovation is its own success. From humble beginnings to a modern manufacturer with global reach, IKO has remained committed to the values that were the foundation of the business envisioned by our founder, **Isidore Koschitzky**. That combination of old-time values, combined with cutting edge technology and innovation, means IKO will continue to **Set the Standard** both now and in the future.

IKO in the UK

In the UK, the IKO name has become synonymous with delivering dependable waterproofing solutions backed by supreme levels of customer service. And little wonder. This hard earned reputation has been built on a foundation of quality and an ethos of customer service, which permeates through the organisation and remains as strong today as it did **100 years ago**.

The rewards speak for themselves. IKO PLC is now well established as the **UK market leader** in the design, manufacture and installation of roofing and waterproofing systems. With this enviable position comes an unwavering commitment and responsibility to continue investing in new product solutions, new manufacturing facilities and the industry's largest team of people, all dedicated to achieving excellence at every level.



About IKO Polymeric

IKO Polymeric offers a full range of polymeric single ply roofing systems, incorporating all of the components required to deliver a complete high performance roof waterproofing solution.

IKO membranes deliver exceptional performance. Single ply membranes are **extremely versatile waterproofing solutions** for both new build and refurbishment projects. With a proven track record across Europe dating back over 50 years and boasting a number of unique qualities, single ply membranes are a popular design choice for specifiers.

Many of these membranes have high reflectivity which means less temperature fluctuations helping to save energy and enhancing lifespan. IKO membranes are also lightweight, flame free, quick to install and provide high aesthetic specification, ideal for both newbuild and refurbishment.

IKO membranes have a choice of applications and can be **adhered, mechanically fixed or ballasted**. IKO can complement the membranes with standing seam profiles which aesthetically can replicate the appearance of aluminium, lead etc. and a choice of pre-formed details to ensure a watertight application.



The key features that make single ply membranes such a popular choice are:

- Performance
- BBA certified
- Safe and reliable installation
- Choice of application methods
- Sleek, attractive finish
- Secure seam welding
- High UV and chemical resistance
- Long life expectancy
- Lightweight
- Flame free
- Complete range of fixings and accessories.

Spectraplan TPE membranes use the latest in advanced polymer technology, combining the best performance characteristics of thermo-plastics and elastomerics.

Armourplan PVC roofing membranes are reinforced and exhibit exceptional mechanical characteristics.

Both Spectraplan TPE and Armourplan PVC have been independently approved by the British Board of Agrément (BBA).

Manufactured in the UK

IKO is the **only UK manufacturer** of single ply roofing membranes, producing high quality waterproofing from its dedicated facility in Chesterfield, UK. The latest extrusion technology and computer controlled manufacture ensure consistently high quality whilst also saving on energy and waste.

IKO and the environment

IKO is committed to minimising environmental impact throughout the product life cycle including planning and paperwork, manufacturing processes and the distribution and use of materials. These also include our energy balance or 'carbon footprint', resource consumption, pollution control and improvements to our surrounding habitat.

The IKO Polymeric manufacturing plant has BS EN ISO 9001 and BS EN ISO 14001* accreditation. It is built using recycled building materials and is designed in accordance with BREEAM**, the world's leading and most widely used environmental assessment method for buildings. It also re-uses by-products from manufacture, wraps products in minimal packaging and employs a streamline transportation network.

All polymeric materials offered by IKO are resistant to weathering, chemical oxidation and UV radiation which ensures long term durability, a key factor in environmental sustainability.

* ISO 9001 is the 'International Standards Organisation' Standard for Quality Management Systems
ISO 14001 is the 'International Standards Organisation' Standard for Environmental Management Systems
**Building Research Establishment Environmental Assessment Method

Visit www.breeam.org for more information.

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Design Considerations

The specification of roofs

The specification and design process is critical to be sure of long term, good quality roof protection that meets the requirements of Building Regulations. A roof's performance is dependent upon material specification, correct design detailing and installation by fully trained operatives, followed up with regular inspection and maintenance.

Your roof is one of your most valuable assets and it is therefore important to be confident that you have made the right choice from the very start.

IKO take great care in providing services and products that offer clients and specifiers effective and positive solutions to meet guidelines set in CDM regulations (Construction Design Management), Codes of Practice set by British Standards, Building Regulations, including Part L, Government Guidelines and BREEAM (British Research Establishment Environmental Assessment Method).

IKO offer an extensive consultation service regarding design, specification and material selection. This service is delivered via a national team of regional design specialists and head office based technical services.

IKO Polymeric

- Minimises the risks through the design process
- Specifies your roof to meet British/ European Standards and Codes of Practice
- Provides British Board of Agrément (BBA) accredited systems
- Provides full NBS Specification Support
- Calculates U-values
- Produces condensation risk analysis
- Presents a good choice of systems
- Includes a range of HCFC and CFC free insulations
- Guarantees can include the materials, workmanship and design.

Design is influenced by:

- Building use
- Deck types
- Thermal design
- Condensation control
- Insulation types
- Falls and methods of drainage.

Building use

The purpose of the building will impact on the design choices. The specification will consider the users and residents, location, surrounding environment, access and specific client criteria.

Deck types

The structural deck provides the primary support for a roofing system. It must be structurally sound and therefore resist dead loads, live loads and wind loads as specified in **BS 6229** and **EN1991-1-4**. It may also be installed so as to provide a suitable fall for surface drainage. Key decks to today's construction are:

Timber - plywood (min. 18mm thick) or OSB3 board (min. 18mm thick)

Concrete - cast in-situ or pre-cast, both of which can be screeded to provide falls

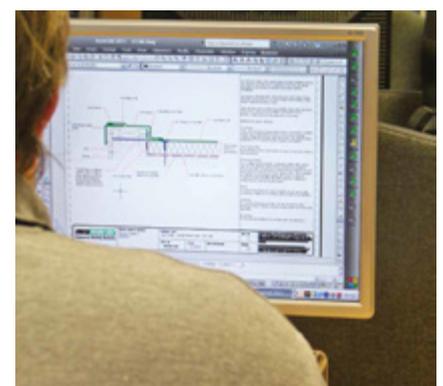
Metal - aluminium or galvanised steel

It is important to note that some decks are moisture sensitive and the deck must be selected to take into account the humidity range over which it needs to perform.

IKO Polymeric **Prefabrication Service** provides an easy, quick installation, while reducing labour costs and delivering a tailored solution to suit individual roofing specifications. **See more page 18.**

Thermal design

Thermal design deals with the flow of both heat and water vapour through a roof construction, and the effect it has upon the components of the roof build up. Suitable thermal insulation should be included with the roof build-up. U-values express the rate of heat transfer through any element of a building, including walls, roofs and windows. IKO can calculate insulation thicknesses to comply with current Building Regulations.



Spectraplan TPE Membranes

Spectraplan roofing systems use the very latest in advanced polymer technology. Incorporating a range of membranes and accessories, these next generation TPE systems combine the best performance characteristics of thermo-plastics (e.g. PVC) and elastomerics (e.g. EPDM). This ensures optimum results both during installation and in performance.



Spectraplan roofing membranes can be mechanically fastened, adhered or loose laid and ballasted. The range comes in one standard colour: Light grey (RAL 7035).

Spectraplan roofing membranes have the additional environmental benefits of being free from plasticisers, chlorine, (H)CFCs and halogens. They can also be recycled into primary products at the end of their long useful life.



St Luke's Church, Wallsend



Novartis, Horsham



Farmfoods, Bristol

Spectraplan SM

Spectraplan SM is a polyester scrim reinforced TPE membrane suitable for mechanically fixing to flat or sloping roofs. During the production process two identical layers of TPE are laminated to and through a polyester scrim reinforcement, resulting in very high mechanical properties.

The Spectraplan SM membranes are loose laid on the substrate and mechanically fixed to the deck using IKOfix mechanical fastenings. The exceptional mechanical strength and joint weld strength of the Spectraplan SM roofing membranes enable the systems to easily withstand calculated wind uplift forces. Lap joints in the membranes are hot air welded.

Spectraplan SM is available in 1.2mm thickness.

Spectraplan SG

Spectraplan SG is a glass tissue reinforced fleece-backed membrane suitable for bonding to flat or sloping roofs. During the production process two identical layers of TPE are laminated to a glass tissue carrier and then into a polyester fleece, resulting in a very high degree of adhesion between the TPE sheet and the fleece backing. Spectraplan SG membranes are bonded to the substrate using Sprayfast FMA and Spectrabond PU adhesives.

Spectraplan SG is available in 1.2mm thickness.

Spectraplan D

Spectraplan D is a homogeneous membrane suitable for executing complex details. During the production process two identical layers of TPE are laminated together, resulting in excellent flexibility and mechanical properties.

Spectraplan D membranes are used in conjunction with Spectraplan SM and SG TPE roofing membranes for detailing purposes. Bonding of the membrane can be carried out by using a suitable adhesive. Lap joints in the membranes are hot air welded.

Spectraplan D is available in 1.5mm thickness.

Spectraplan Walkway

Heavy duty walkway membrane with slip resisting surface.

A comprehensive range of accessories is also available to complement the Spectraplan membranes.

Summary of benefits

- Latest polymer technology
- Environmental benefits
- No need for solvent cleaning
- Compatible with bitumen and expanded polystyrene
- High resistance to ageing and wind uplift
- Non-capillary construction - does not absorb moisture
- Resistance to root penetration
- Excellent welding characteristics
- Elasticity
- Complete range of fixings and accessories.

Approval

Spectraplan TPE membranes have been independently certified by the **British Board of Agrément (BBA No. 05/4203)** to provide a durable roof covering with a service life in excess of 30 years.



TPE as the basic polymer in Spectraplan roofing membranes

TPE is the collective term for a particular group of polyolefins with the basic properties of elastomers (flexibility, elasticity), but which can be processed as thermoplasts (thermal softening, plastic deformation).

Polyolefins are polymers (plastics) based exclusively on carbon and hydrogen; examples include modified polyethylene and polypropylene.

These more traditional polyolefins are well known thermoplasts which exhibit some excellent properties, and are commercially known as TPO.

However, the use of state-of-the-art catalysts in a unique process gives rise to very pure polyolefins with a predominantly elastomeric nature, resulting in the thermoplastic properties being more controllable (TPE).

TPE in Spectraplan, offers the favourable properties of both thermoplasts and elastomers

TPE has a chemically ingrained flexibility, in contrast with the thermoplasts, the flexibility of which is derived from the physical behaviour of the additions to the polymer chains (softeners, rubber additives, synthetic modifiers).

TPE displays wide-ranging flow behaviour, while elastomers do not exhibit any flow behaviour. Thanks to the unique properties of TPE as an engineered polymer, TPE has already been used for many years in extreme industrial applications, and now also as roofing membranes. Spectraplan TPE roofing membranes offer solutions for all existing single ply roofing systems; mechanically fastened, adhered and ballasted.



Cornwall Hotel, St Austell

The exceptional product properties of Spectraplan roofing membranes

High resistance to ageing

Spectraplan roofing membranes hardly degrade under UV exposure. The action of ozone does not cause surface erosion. Standing water does not have any detrimental or leaching effects. This ensures a **very long life expectancy** for Spectraplan TPE roofing systems.

Reliable and secure seam welding

The Spectraplan TPE polymer has a very broad 'thermal welding range', which minimises its operational sensitivity. This is determined by the excellent flow behaviour of the TPE polymer. Spectraplan roofing membranes also have high internal cohesion.

The use of identical TPE polymers at the top and bottom side of the roofing membranes, combined with the excellent flow behaviour, produces a **homogeneous and reliable weld**, which is stronger than the roofing sheet itself.

The TPE polymer does not absorb water, thus ensuring a high quality heat-welded joint, even after ageing.

Non-capillary construction

The excellent flow behaviour of the polymer ensures perfect coating of the polyester fibres of the carrier so that no capillaries are created.

Spectraplan TPE roofing membranes are reinforced with **fibres that do not absorb moisture**.

Resistance to root penetration

The elastomeric nature of the TPE provides Spectraplan roofing membranes with particularly good resistance to root penetration.

Chemical resistance and compatibility

The high degree of purity in the TPE polymers, their amorphous structure and the absence of volatile substances lead to exceptionally high chemical resistance.

Spectraplan TPE roofing membranes are resistant to many organic and inorganic substances and solvents.

Spectraplan TPE roofing membranes are also compatible with bitumen and they can be directly applied to existing bituminous coverings and polystyrene (EPS/XPS), without a separation layer being required.

Elasticity

Due to the long lasting high degree of elasticity of TPE, Spectraplan roofing membranes have high resistance to fatigue and point loading.

Movement within the substructure can also largely be accommodated without the need for special detailing.

Memory-effect

Unlike TPOs, the memory effect associated with elastomers occurs with Spectraplan TPE roofing membranes. As a result of this the installations can benefit from a taut appearance, without this being caused by the exertion of force as tension at the perimeter.

Spectraplan TPE Membranes (continued)

Long life expectancy

The homogeneity of Spectraplan TPE basic polymers and the absence of softeners result in a very stable chemical compound. Spectraplan roofing membranes remain elastic almost indefinitely and barely age. **They do not absorb moisture, do not degrade under UV and/or ozone exposure, do not leach and are rot resistant.**

Spectraplan TPE roofing membranes have exceptional chemical resistance and are compatible with all standard building materials. Spectraplan TPE roofing membranes can deservedly be considered as a further development and improvement of the current generation of TPO roofing membranes. The independent testing has highlighted that the life expectancy of Spectraplan TPE roofing systems is in excess of **30 years**.

Environmentally friendly and recyclable

In contrast to the chlorine containing polymer membranes which exist in the market, Spectraplan TPE roofing membranes are particularly environmentally friendly.

Spectraplan TPE roofing membranes are free of halogens (Chlorine, Fluorine, Bromine and Iodine), softeners and (H)CFCs. TPE polymer is homogeneous and pure, so that recycling as a durable raw material in new primary end products is possible at the end of its long lifespan.

Spectraplan TPE roofing systems do not leach and can therefore be installed on a wide range of water storage applications and on roofs where rainwater is directly discharged to surface drainage.

Safe and reliable installation

Spectraplan TPE roofing membranes are thermally welded using hot air. **No noxious irritating vapours or smoke are released** during the welding process. Spectraplan TPE roofing membranes contrast sharply with all commercially available thermoplasts thanks to their unique and broad welding range and the excellent flow behaviour of the TPE polymer. This results in **fast installation** with a high degree of certainty and excellent quality of the weld, which is stronger than the actual roofing sheet itself.

The use of noxious solvents is not required prior to welding.

Spectraplan TPE roofing membranes can be easily installed even at the highest summer temperatures and also remain flexible under cold winter conditions.

Spectraplan TPE roofing systems can even be applied on **roofs under extreme loads** such as rooftop car parks and roof gardens.



Dulverton Doctors Surgery, Devon



St James Place, Cirencester



Coronation Road, Bristol



Park Tower, Hartlepool

Optimal fire safety for people and the environment

Spectraplan TPE roofing systems are fire resistant in accordance with the new stringent European fire standard **EN1187**. The fire retardants used in Spectraplan TPE polymer are non-toxic and free of halogens. In case of fire, Spectraplan TPE roofing membranes do not contribute to the smoke load and no toxic gases are released; nor does any flame extension take place due to melting TPE polymer dripping down.

High resistance to wind uplift

The IKOFix mechanical fastening system has been specifically designed for the Spectraplan SM sheet range.

It includes corrosion resistant screws and both thermally efficient tubes and washer plates, flat bars and peelstops for perimeter restraints, and is applicable to any substrate suitable for mechanical attachment.

The combination of IKOFix mechanical fastening system with the exceptional mechanical properties of Spectraplan SM TPE roofing membranes, results in a particularly high capacity to absorb forces and divert them to the substructure.

This makes it feasible to calculate a cost-effective fastening system for each and every project.

Maintenance and repair friendly

Spectraplan TPE roofing systems do not absorb moisture and are only affected by dirt-pickup to a very small degree.

This means that it remains possible to make repairs or add further details if required in the future.

Spectraplan TPE roofing systems are easy to clean with solutions of soft soap, using a soft broom or soft cloth.

High-pressure cleaners can also be used.

Armourplan PVC Membranes

Armourplan is a reinforced PVC membrane which is suitable for use on a wide range of roofing applications, including specialist installations such as simulated metal roofs.



Produced in a range of different membranes, each designed for specific applications. The range comes in two standard colours; mid grey (RAL 7046) and slate grey (RAL 7015). Other colours are available to meet project requirements.*

The flexibility of the Armourplan range of products offers a number of build-up applications each designed to provide **optimum waterproof protection**. Armourplan is suitable for warm or cold roofs whether the roof is flat, inverted, or sloped.

The IKO warm roof build-up consists of the latest technology from the installation of the high performance vapour control layer and insulation to the final layer.

Armourplan PVC membranes can be mechanically fastened, adhered or ballasted providing maximum system flexibility.

Armourplan SM

Armourplan SM is a polyester scrim reinforced PVC single ply roofing membrane. Suitable for use in a wide range of roofing applications on both flat and sloping roofs it forms an aesthetically pleasing sleek skin. Armourplan SM can be installed onto most common substrates and is suitable for both new build and refurbishment installations and for specialist applications such as simulated metal roofs.

Armourplan SM is primarily mechanically fixed using suitable IKOfix stress plates and IKOfix screws, but can also be adhered. It forms a sleek skin on many types of roof application. All overlaps are hot air welded using suitable hot air welding equipment.

Armourplan SM is also used as the upstand detailing membrane on all Armourplan SM/SG systems.

Armourplan SM is available in either 1.2mm or 1.5mm thicknesses.

Armourplan SG

Armourplan SG is a glass tissue reinforced fleece-backed membrane suitable for bonding to flat or sloping roofs. During the production process two layers of PVC are laminated to a glass tissue carrier and then into a polyester fleece, resulting in a very high degree of adhesion between the PVC membrane and the fleece backing. Armourplan SG membranes are bonded to the substrate using Sprayfast FMA and Spectrabond PU adhesives.

Armourplan SG can be installed onto the following substrates:

- Plywood and oriented strand board
- Smooth concrete
- Profiled metal decking (with suitable overlay)
- Woodwool slab
- PIR Insulation
- Suitable density mineral wool
- Composite coldstore roofing panels.

Armourplan SG is available in either 1.2mm or 1.5mm thicknesses.

Armourplan P

Armourplan P is a robust polyester reinforced, versatile membrane which can be mechanically fixed, adhered or ballasted. It is suitable for a variety of roofing applications on both flat and sloping roofs.

Armourplan P is available in 1.2mm thickness.



Blacon Crematorium, Chesterfield

*Minimum volumes and extended lead times required for non-standard colours.

Armourplan PSG

Armourplan PSG is a glass tissue reinforced polyester fleece-backed PVC single ply roofing membrane, suitable for use in a wide range of roofing applications on both flat and sloping roofs.

Armourplan PSG can be adhered onto most common substrates using Spectrabond Low Foaming PU Adhesive or IKOpro Sprayfast FMA Adhesive and is suitable for both new build and refurbishment installations and for specialist applications such as simulated metal roofs.

During the production process, two layers of PVC are laminated to a glass tissue carrier and then into a polyester fleece, resulting in a very high degree of adhesion between the PVC sheet and the fleece backing.

Lap joints in the membranes are hot air welded. The exceptional mechanical strength and weld joint strength of the Armourplan PSG roofing membranes enable the systems to easily withstand calculated wind uplift forces.

Armourplan PSG is available in 1.2mm thickness.

Armourplan Walkway

Armourplan Walkway is a heavy duty PVC membrane in roll form finished with a slip resisting surface.

The membrane is designed to provide a designated walkway to lightly trafficked areas and protects the prime waterproofing function of the underlying Armourplan roofing membrane.

Armourplan Walkway is quick and easy to install, by welding to the finished roof surface.

A comprehensive range of accessories is also available to complement the Armourplan membranes.

Summary of benefits

- Exceptional mechanical properties
- Excellent product performance
- Choice of RAL colours
- High UV resistance
- Sleek finish
- Secure seam welding quality
- Complete range of fixings and accessories.



Bell Lane, Lewes

Performance

Due to a high specification reinforcement and advanced manufacturing techniques, Armourplan exhibits exceptional mechanical characteristics available in a range of thicknesses and widths to suit every requirement.

Approval

Armourplan PVC roofing membranes have been independently certified by the **British Board of Agrément (BBA No. 05/4287)** to provide a durable roof waterproofing with a service life in excess of 30 years. It is also FM approved.



Reliable protection

Armourplan membranes are manufactured using a state-of-the-art extrusion process with enhanced polymer technology, and have been intensively tested to ensure they retain their stunning visual appearance. The reinforcement is therefore encapsulated by high performance PVC, providing consistent and enduring protection.

A sleek, attractive finish

Armourplan forms a sleek skin on many types of roof application, whether mechanically secured or adhered. Design can be further enhanced with the use of the wide range of ancillary items including standing seam profiles, where a traditional metal appearance is desired.



Oasis Academy, Isle of Sheppey



Extra Care, Gosport

Aesthetically pleasing

Armourplan membranes are available in a wide range of innovative and attractive colours* and are UV-stable. A roof can therefore be transformed into an attractive feature, giving the client almost unlimited design possibilities.

Secure seam welding

Armourplan PVC membranes are designed to be welded together to form homogenous, reliable joints. In addition, Armourplan P and PSG are unique in the UK market and produced by utilising the same high quality UV resistant PVC compound on both the upper and lower sides of the membrane to ensure optimal weld strength and quality.



Jack Jones House, Liverpool

Spectradek



Farmfoods, Bristol



Versatile, Fast-Track Roofing Option

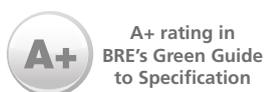
IKO Spectradek is a single component, factory engineered roof panel, consisting of a high performance Spectraplan TPE waterproofing membrane (**combining the best performance characteristics of thermoplastics (PVC) and elastomers (EPDM)** with excellent welding characteristics) with insulation and a trapezoidal steel deck.

It is suitable for flat and pitched roofs above 1:80 (0.72°) after deflection and curved roof applications with a convex curve (45m radius) or concave curve (50m radius).

Quality and Durability

IKO Spectradek panels incorporating Spectraplan TPE membranes can achieve an A+ rating in BRE's Green Guide to Specification. They can be manufactured in both left hand to right hand (LH) and right to left handed (RH) formats for ease of handling and installation.

Manufactured from the highest quality materials to rigorous quality control standards, using state of the art production equipment, IKO Spectradek panels are also manufactured in compliance with both the **BS EN ISO 9001 Quality Management System** and the **BS EN ISO 14001 Environmental Management System**.



Coatings

IKO Spectradek is available with a variety of finishes to suit the internal conditions of the building. The standard liner is bright white polyester, which provides an easily cleaned surface.

Where internal conditions are more demanding, such as high internal humidity or clean room conditions, CLEANsafe coatings are available subject to minimum quantities. These specially designed coatings are ideal for use where the panels are to be cleaned down on a regular basis.

The insulated roof panels are manufactured with an ECOsafe and FIREsafe Polyisocyanurate (PIR) core and are normally immune to attack from mould, fungi, mildew and vermin. No urea formaldehyde is used in the construction and the panels are not considered to be harmful.

Available Panel Lengths

Standard Lengths	1.5m - 12m
Longer Lengths (non-standard)	12m - 16m
Shorter Lengths (non-standard)	Below 1.5m

Note: Additional costs and transport restrictions may apply for non-standard lengths. All lengths may change for export (outside of the UK).

Materials

Substrate:

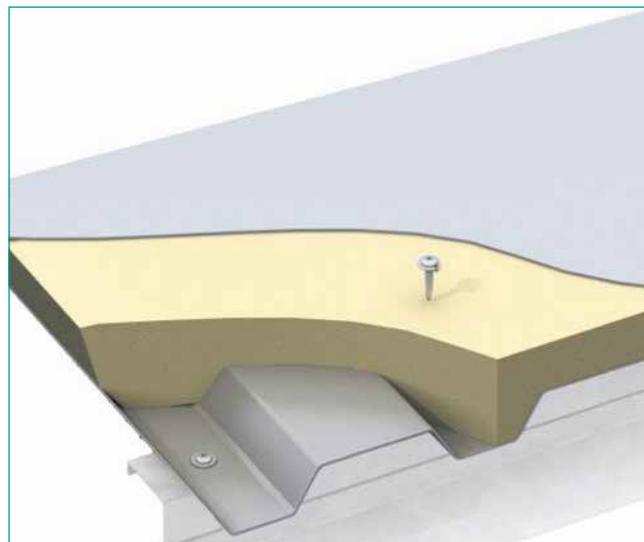
- Bright White Polyester: S220GD+ZA hot dip zinc alloy coated to BS EN 10346: 2009.
- Standard internal steel sheet thickness 0.5mm.

Membrane:

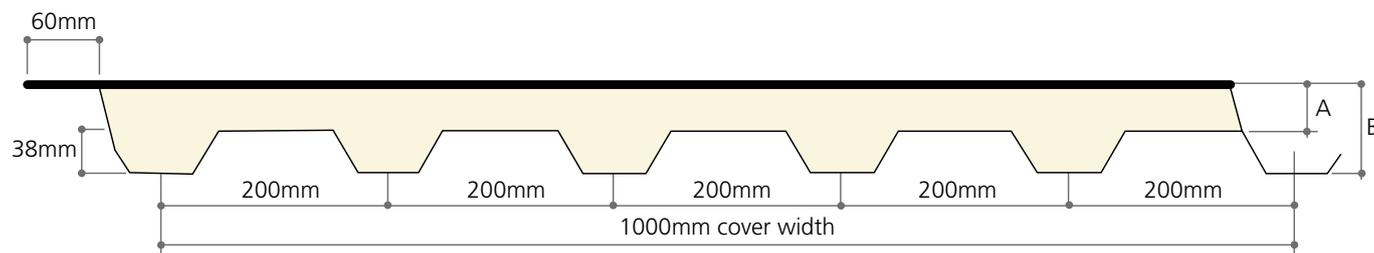
- 1.2mm thickness IKO Spectraplan TPE

Air Leakage:

- An air leakage rate of 3m³ /hr/m² at 50Pa or less can be achieved.



Thermal Performance



Core Thickness A (mm)	34	71	91	100	120
Overall Thickness B (mm)	72	109	129	138	158
U-value (W/m²k)	0.48	0.25	0.20	0.18	0.15
Weight kg/m² (0.5mm Deck)	9.0	10.5	11.3	11.7	12.5

Note: IKO Spectradek insulated roof panels have a thermal transmittance (U-value) as detailed in the table above, calculated using the method required by the building regulations Part L2 (England & Wales) and Building Standards Section 6 (Scotland).

Structural Tables - 0.5mm Deck

Unfactored load/span table (use unfactored calculated design wind load values).

Span Condition	Uniformly distributed loads KN/m ² Span L in metres										
	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Downward	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Single	6.72	3.89	2.45	1.64	1.15	0.84	0.63	0.49	0.38	-	-
Double	5.56	4.08	3.13	2.47	2.01	1.65	1.36	1.14	0.92	0.74	0.60

Span Condition	Uniformly distributed loads KN/m ² Span L in metres										
	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Suction	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
One Fastener	1.44	1.20	1.03	0.90	0.80	0.72	0.65	0.60	0.55	0.51	0.48
Two Fasteners	2.88	2.40	2.06	1.80	1.60	1.44	1.31	1.20	1.11	1.03	0.96
Five Fasteners	7.20	6.00	5.14	4.50	4.00	3.42*	2.57*	1.98*	1.56*	1.25*	1.01*

Notes:

- Above figures are for all panel thicknesses.
- *Fastener table based upon minimum 1.5mm thick steel purlins and suction load on panel.
- The following deflection limits have been used:
 - Downward loading L/250
 - Suction loading L/150
- Wind uplift capacity of the panels is dependent on the fixing pattern and it is usually this design condition which is critical for any roofing system.
- The wind load is unique to each project and calculation for wind loads should be in accordance with BS 6399-2:1997 Loading for buildings. Code of practice for wind loads.

Key Benefits

- Latest polymer technology
- Environmental benefits
- No need for solvent cleaning or preparation of laps
- High resistance to ageing
- Non capillary construction - does not absorb moisture
- Rapid, secure welding characteristics
- Fast track installation
- Full range of system accessories
- Manufactured in the UK



Sustainable Urban Drainage Systems (SuDS)

A Sustainable Urban Drainage Systems (SuDS) provides a more natural approach to runoff management, reducing the risk of downstream flooding and water pollution while creating direct improvements to amenity and biodiversity.



Sustainable Urban Drainage Systems (SuDS)

SuDS are a concept to manage and to deal with surface water and mimic natural drainage characteristics. It ensures an engineered control quality and quantity of runoff (rates, volume and frequency), while potentially providing amenity and biodiversity benefits.

In extreme situations, highly developed locations with little natural landscaping can produce high levels of surface water run-off. Tailored to suit particular requirements, SuDS aims to deal with runoff as close to source as possible (source control), effectively creating a treatment train that **removes pollution** and **reduces the volume of water** that is discharged to sewers or watercourses.

Conventional 'end of line' system

Water is collected & conveyed away as quickly as possible usually in gravity pipework systems. Attenuation or infiltration is usually at the end of line via large diameter pipes, modular tanks or ponds and basins. Invert levels are typically 3-9m below the finished ground level.

Source control system

Water is usually collected and stored close to where it lands. It is typically conveyed slowly and is stored in shallow features reducing the pass forward flow and velocity resulting in pipe size and depth reductions. Attenuation or infiltration usually takes place via features such as swales or high strength modular shallow plastic structures, with invert levels typically only 0.5 – 1.5m below finished ground level.

Site-wide or regional approach

Requires far more space and a greater depth of excavation. Aggregate needs to be imported and certain site spoil must be disposed of. Compared with other approaches to SuDS, this method tends to be relatively expensive.

The roofing solution

Roofs are ideal as a source control system to control discharge. Run-off can be more readily harvested for re-use/recycling using gravity drainage and/or passive irrigation via capillarity. Water volumes stored on the roof actually replaces the equivalent volume at or below ground level making it is easier to access and maintain.

Podium roof deck solution

Geocellular podium deck water management systems can be easily integrated into an overall SuDS design. This can significantly enhance the sustainability of a project by allowing harvested rainwater to be used for the irrigation of green areas or toilet and urinal flushing, potentially without the need for pumping. Used beneath permeable paving instead of an aggregate sub-base, it reduces the need for surface drains and channels and for falls in the deck surface.

Typical podium deck water management systems are either 85mm or 150mm thick and have a 95% void ratio. These systems also tend to be manufactured from polypropylene that is lightweight, recyclable and reusable. They also act as a protective layer that insulates from climatic effects such as solar gain, UV exposure and temperature variations.

BREEAM

An effective rooftop SuDS solution can help with obtaining a wide range of BREEAM credits.

For further information on our RIBA CPD program, or expert advice concerning SuDS solutions, please contact IKO Polymeric on 01257 255 771 or email marketing@ikogroup.co.uk

Features and Benefits

- Effectively manage surface water
- Mimics natural drainage characteristics
- Engineered control, quality runoff
- Quantity - rates, volume and frequency
- Amenity and biodiversity benefits
- Runoff source control
- Treatment train to remove pollution
- Combination of techniques or components to suit constraints

Green Roofs

In this age of urban development and increased city and industrial areas, green roof design can help to redress the balance of nature by significantly improving air quality and reducing water run-off. Spectraplan TPE integrates exceptionally well with green roof systems providing a sound waterproofing foundation.

Green roofs can improve the acoustics, thermal properties and aesthetic qualities of a building, whilst also providing additional space for recreational use and habitat for flora and fauna. In addition, they provide extra protection for the waterproofing membrane from the extremes of climatic conditions.

The reduction in storm water run-off is a major benefit. From the results gained by practical trials, the average extensive system can absorb approximately 50% of the rainwater falling on it, and also significantly delay the passage of remaining water, reducing the pressure on drainage facilities and flooding. Intensive systems incorporating sufficient soil depth can retain 75% of rainfall up to 90% with greater soil depths.

Thermal transmission is also key. 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%.**[†]

[†] US Environmental Protection Agency.



British Horse Society, Warwickshire



What are the green roof options?

The IKOgreen range has been designed to work with all types of green roof constructions.

Extensive green roofs - low maintenance planting without the need for specific irrigation. Add instantly to the aesthetics of the roof.

Intensive roof gardens - a designed garden with increased growing medium, drainage and irrigation. Shrubs and trees can be accommodated.

Biodiverse (brown) roofs - constructed to incorporate recycled materials (e.g crushed brick, concrete etc) into the growing medium. Creates a natural wasteland to attract fauna and flora of all kinds.

Retro green roofs - lightweight modular system designed specifically for refurbishment and retro-fit applications.

High Performance Thermal Insulation

IKO insulation boards are made from lightweight, fire resistant, rigid PIR foam core, with high compressive strength and dimensional stability. The highly efficient closed cell structure has a low thermal conductivity and easily achieves required U-values with a minimum thickness. The current requirements for thermal insulation are set out in Building Regulations Approved Documents L1 and L2 2013: Conservation of fuel and power.



IKO enertherm is lightweight, making it easier to handle and install for the contractor. It has outstanding fire resistant properties, and does not melt, therefore does not produce burning droplets. There is no extra fire spread.

IKO enertherm is available in different sizes and thicknesses.

IKO enertherm PIR MG

A totally CFC/HCFC-free, rigid polyisocyanurate foam insulation board, faced on both sides with perforated (mineral coated) glass tissue. IKO enertherm PIR MG has a thermal conductivity value of 0.026W/mK (90mm thickness and above).

Board Size:

1200 x 1000mm

Standard thicknesses:

30/40/50/60/70/80/90/100/120/140mm

IKO enertherm PIR ALU

A totally CFC/HCFC-free, rigid polyisocyanurate foam insulation board, clad on both sides with a structured aluminium facing. IKO enertherm PIR ALU offers outstanding insulating properties, with a thermal conductivity of 0.022W/mK (90mm thickness and above) and is FM approved.

Board Size:

1200 x 1000mm
1200 x 600mm
2400 x 1200mm



Standard thicknesses:

25*/30/40/50/60/70/80/90/100/110/120/140/160/180/200mm

*only available in 2400 x 1200mm

Features and Benefits

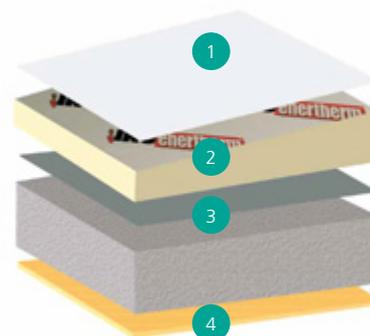
- Fire performance polyisocyanurate foam core
- Mineral glass or composite aluminium facings available
- Lightweight and easy to handle
- High insulation value/low thermal conductivity
- Rot proof, durable and maintenance free
- Ideal for meeting the increasingly demanding Building Regulations and Part L requirements
- Tapered/cut-to-falls boards also available
- Zero global warming potential
- Zero ozone depletion potential
- Fire classification for ALU boards – Euroclass Bs2 d0 (application on metal decks).

Insulation Thickness (mm)	U-values (W/m²K)	
	IKO enertherm PIR ALU*	IKO enertherm PIR MG*
30	0.47	0.54
40	0.39	0.45
50	0.33	0.39
60	0.28	0.34
70	0.25	0.30
80	0.23	0.27
90	0.21	0.24
100	0.19	0.23
110	0.18	-
120	0.17	0.19
140	0.15	0.17
160	0.13	-
180	0.12	-
200	0.11	-

*The U-value calculations are based on the following construction build up; IKO Polymeric membrane – IKO enertherm insulation - VCL – 18mm ply/timber – 200mm ceiling void – suspended ceiling. Calculations that involve a two board build up are based on both being the same type.

Tapered roofing system

1. Spectraplan or Armourplan membrane
2. IKO enertherm insulation
3. Vapour control layer
4. Structural deck



Systems Components and Accessories

Vapour control layers

A range of polyethylene and bituminous options to ensure optimum performance when used in a warm roof build up.

Adhesives and sealants

IKO's portfolio includes PU low foaming and contact adhesives for bonding membranes, PU adhesive for bonding insulation boards, fibre reinforced liquid detailings, primers and substrate cleaners. PVC and TPE sealants and mastics are also available.

IKO Sprayfast (See specific brochure for more details)

IKOpro Sprayfast PCA

A moisture-curing polyurethane adhesive that enables professional, simple and secure bonding on-fleece backed PVC roofing membranes to a wide range of roof substrates. It features two-way stick application, providing high grab and instant bond, and making it ideal for use on both large-scale fieldwork and detailing.

In addition to large roof areas, it is ideal for use on vertical substrates and other detailing work, such as attaching membrane to roof lights. **Coverage up to 100m².**

IKOpro Sprayfast FMA

A moisture-curing polyurethane adhesive that enables fast, secure and professional bonding of fleece-backed polymeric roofing membranes to insulation boards and other substrates, suitable for both small & large-scale fieldwork.

IKOpro Sprayfast FMA can be relied upon to securely bond fleece-backed membranes. BRE tested for resistance to wind uplift with exceptional long-term ageing properties, where minimal adhesive is required to ensure a strong, long-lasting bond. **Coverage up to 180m².**

IKOpro Sprayfast IBA

A moisture-curing polyurethane adhesive that can be applied faster and more accurately than standard hand-poured PU adhesives, enabling rapid professional bonding of a wide range of insulation boards to VCL or straight to deck.

It is a solvent-free adhesive that is compatible with a variety of insulation boards, including EPS, XPS and PIR (tissue and foil-faced).

Coverage up to 350m².

Mechanical fixings and clamping bars

A complete choice of accessories including IKOfix mechanical fastening systems from synthetic to steel parts depending on the requirements of your roof. This includes thermally broken pressure plates, fixings, pressure plates, toothed flatbars and peelstops, all designed to meet the demands of numerous deck types and insulation thicknesses. **Note:** Stainless steel fixings to be used on aluminium decks.

Cover straps

Armourplan Straps are reinforced or homogenous straps for joining Armourplan SG sheet ends. They are also used for detailing and weathering additional mid-sheet fasteners.

Pre-fabricated bespoke details/corners

IKO offer a number of Bespoke PVC pre-formed details to assist rapid, watertight application. The range includes internal and external corners and roof outlet pipes.

Walkway membranes

Walkway membranes are developed to meet the diverse demands of roofing contractors, by protecting underlying roof membranes from damage by necessary foot traffic, inadvertent tool drops or equipment movement. A non-slip pattern and yellow safety edge (conforming to OSHA specifications) can protect workers and minimising liability issues.

Adjustable Paving Support Pads

Support pads can be laid on waterproofing membranes and are designed to be used where fine adjustment in height is required to obtain a level paved area on a roof deck, facilitating the transformation of flat roof areas into patios, terraces, balconies and walkways. This is normally the case where the roof has been laid to falls for drainage, or where the deck is uneven.

They are also an effective way of creating a void beneath the slabs large enough to conceal pipes, cables and other utility installations and services. Slabs can be easily removed, allowing maintenance to be carried out.

Liquid detailing

Polimar UV is an elastomeric, high build single component polyurethane UV stable liquid detailing system which comprises a blend of moisture triggered polyurethane resins. Once applied, the cured membrane forms a seamless durable waterproof barrier which provides excellent thermal and UV stability for all climatic conditions.

Rainwater outlets

Specialist units to assist with drainage off a roof.

Rainwater management

Armourflow Coated Metal is a 2.4mm thick PVC faced steel sheet specifically developed to be formed into high performance gutter sections for use on commercial building projects.

Rooflights

IKO offers rooflights with curved dome or pyramid profiles in a wide range of sizes. A full range of ventilation and opening options accompanies the portfolio. A circular dome option is also available (supplied with a GRP kerb).

IKO D-Marc

A wind-resistant demarcation system for flat rooftops. Applications may be for the purpose of preventing access to hazards during regular rooftop maintenance or to provide safe access across the roof.

IKOrail guard rail system

Guardrails which can be fixed to a roof permanently or can be non-penetrative, free-standing with the use of a counterweight.

Standing seam profile

IKO's standing seam profiles are pre-formed profiles designed to replicate the appearance of a metal standing seam joint and is manufactured from homogenous TPE or PVC.

IKO Strike Lightning Conductor Clip

IKO Strike lightning conductor clips are a combination of a high quality rigid plastic clip attached to polyester reinforced Armourplan or Spectraplan membrane, allowing for a cost effective and tidy solution to rooftop lightning protection systems.

Prefabrication Service

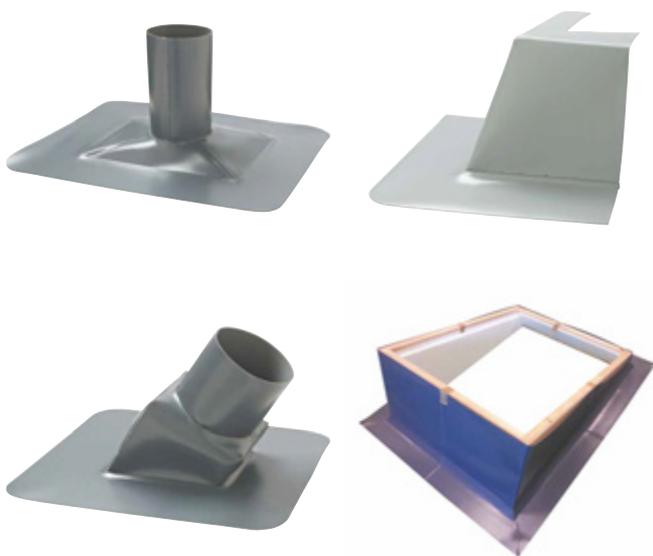
Modular building construction is fast becoming the preferred method for many local authorities and commercial organisations, including schools, hospitals, offices, retail outlets, hotels, residential developments and prisons.

IKO Polymeric can provide a dedicated offsite prefabrication service offering many unique solutions for the roofing industry in general but in particular for the offsite, SIPS & modular industries through the use of our well established Armourplan PVC Roofing Membranes.

The IKO Polymeric prefabrication service includes:

- Made to measure roof coverings in a variety of widths and lengths for permanent waterproofing solutions
- Temporary roof blankets for transportation and storage purposes
- Bespoke roofing details for all types of roof penetrations from standard pipe installations to complex mechanical services, roof lights, access hatches & fall-arrest systems to name just a few.

Undertaking most of the work in a factory rather than on-site allows for much greater quality control and better observance to project deadlines along with considerable savings to labour costs. The quality achievable with factory pre-fabrication is generally much higher than can be achieved on site, particularly within those industries that use welding and hot trades such as roofing and mechanical services.



Sainsbury's, Melton Mowbray

IKO bespoke roof details and quality control

IKO Polymeric's bespoke roofing products are manufactured under the tight control of our registered quality management system to ensure the highest levels of product and workmanship.

All roofing details are manufactured to the exact design of the client, drawn in AutoCAD and machine cut using the latest technology. Each membrane section is hand assembled using high frequency welding techniques to form a completely watertight detail which then passes a final quality check prior to despatch.

The key benefits of utilising a prefabricated roof are:

- Engineered to your **own specification**/design
- **Ease** of installation
- **Rapid** on-site installation
- Significant **reductions** in labour costs
- **Guaranteed** quality

A Complete Service

Delivering quality is at the heart of IKO's service. The company provides a full service offer from initial consultation through specification and design to ongoing monitoring and maintenance. By understanding your requirements from your perspective, we are able to deliver bespoke packages that suit the criteria of your project.

Consultation and design

An essential first step is to establish the type of roof being constructed and confirm all the elements that will form the criteria for selecting the appropriate materials with a relevant design framework. IKO consults with the client to evaluate their brief to meet the demands set by the project.

Be it an individual detail or an entire roofing project, our customers can be assured of comprehensive and professional design advice.

IKO will cover:

- Assessment of U-values (thermal design) and condensation risk analysis
- Building regulations compliance
- Tapered insulation schemes
- Accessories and access planning
- CAD site plan
- Green roof design
- Roof drainage calculations
- Wind uplift calculations carried out to **BS EN 1991-1-4**.

Your specification will provide a full programme of works to be carried out and includes necessary design detailing, illustrated by drawings produced on one of our fully dedicated CAD systems.



On site assistance and project monitoring

As part of IKO's ongoing service commitment, a member of the Technical team will visit site and work with the contractor to ensure a satisfactory conclusion to any issues that occur.

IKO Technical Engineers will carry out post installation inspections which will include regular written reports (including the final sign off inspection) with photographic records that will be recorded on IKO's centralised database containing all the technical details.

Performance guarantees

IKO Polymeric offers a range of guarantees to support your roofing specification.



Approved contractor scheme

IKO's roofing systems are only ever installed by approved contractors that have undertaken one of **IKO's dedicated training programmes** at our specialist training facilities.

With selection and training criteria that are among the most demanding in the industry and nationwide network coverage, you can be confident that wherever you call upon their services, your installation will be managed to the highest possible standards.

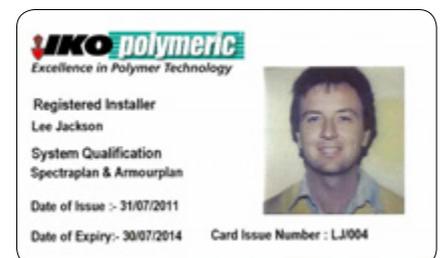


Installation by Trained and Qualified Contractors - Nationwide

The IKO Polymeric nationwide network of approved contractors has been handpicked to ensure every installation meets our rigorous standards in quality, workmanship and health and safety.

To gain accreditation, all operatives must undergo our extensive programme of training: a process which continues in conjunction with our ongoing commitment to new products and systems.

The result guarantees a waterproofing system fit for generations to come.



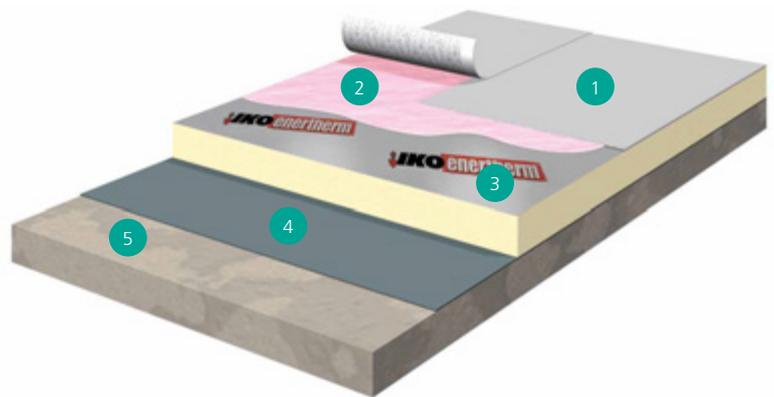
Typical Build-Ups

These drawings represent typical roof build-ups. IKO's Technical Services Team can advise on specific design elements required for individual projects.

For further information or expert advice concerning details please contact the IKO Technical Services Department on 01257 488 012 or email technical@ikogroup.co.uk

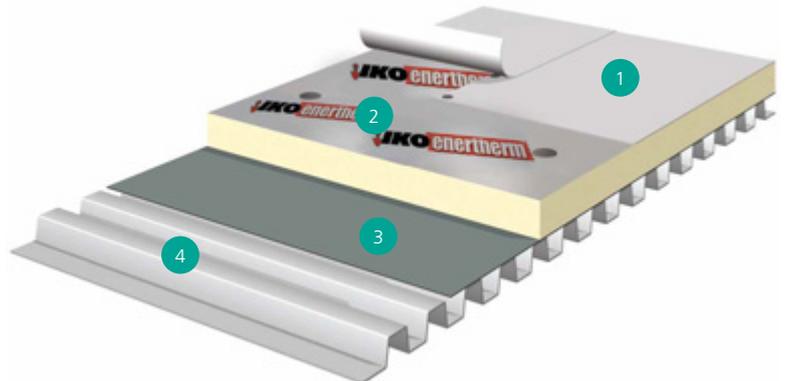
Adhered roofing system

1. Spectraplan SG or Armourplan SG or PSG membranes
2. IKOpro PU Adhesive or Sprayfast FMA
3. IKO enertherm insulation
4. Vapour control layer
5. Structural deck



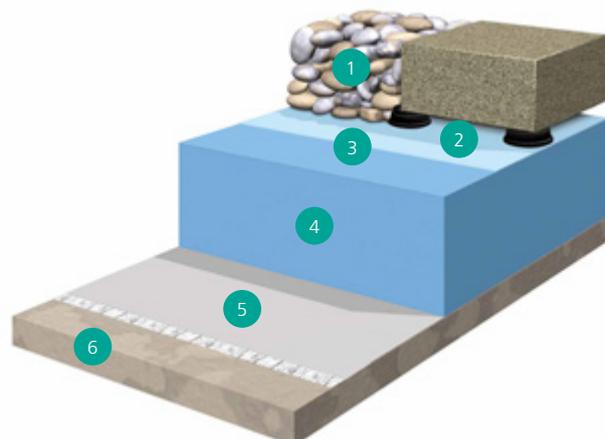
Mechanically fastened roofing system

1. Spectraplan SM or Armourplan SM and P membranes mechanically fixed
2. IKO enertherm insulation
3. Vapour control layer
4. Structural deck



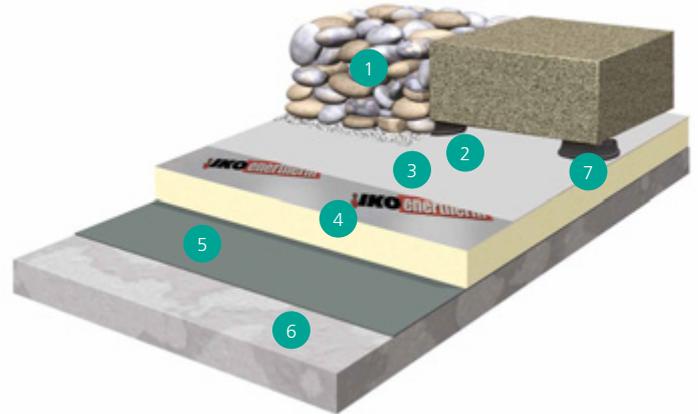
Inverted and ballasted roofing system

1. Ballast and/or concrete loading coat
2. Paving support pads
3. IKO separation layer
4. Extruded polystyrene (loose laid)
5. Spectraplan SM or Armourplan SM or P membrane (loose laid) or fixed into IKO separation fleece)
6. Structural deck



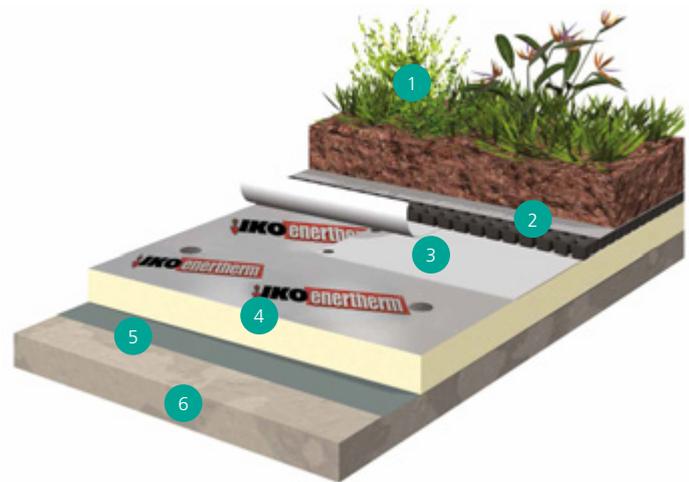
Warm ballasted roofing system

1. Ballast and/or concrete loading coat
2. IKO Separation Fleece
3. Spectraplan SM or Armourplan SM or P membrane (loose laid) or fixed
4. IKO enertherm insulation
5. Vapour control layer
6. Structural deck
7. Paving support pads



Green roofing system

1. Growing medium
2. Filtration and drainage layer
3. Spectraplan SM membrane mechanically fixed
4. IKO enertherm insulation
5. Vapour control layer
6. Structural deck

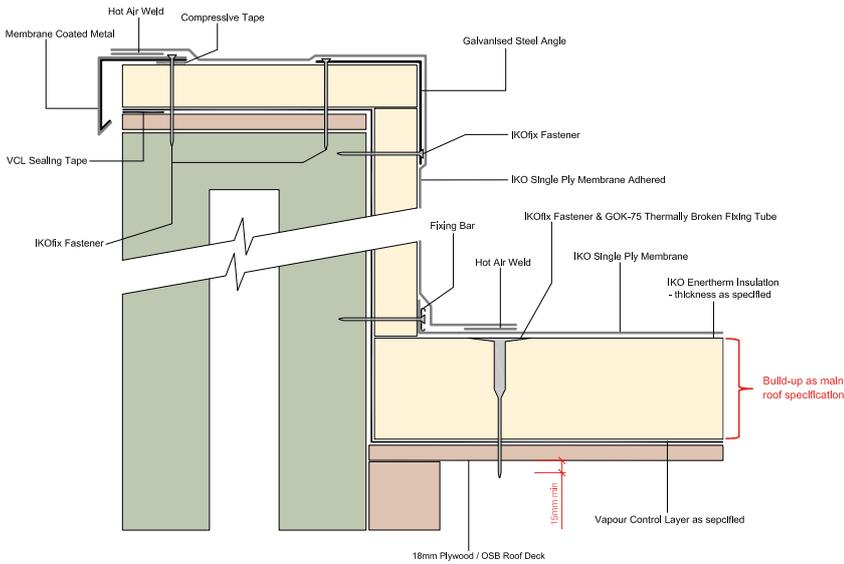


Typical Details

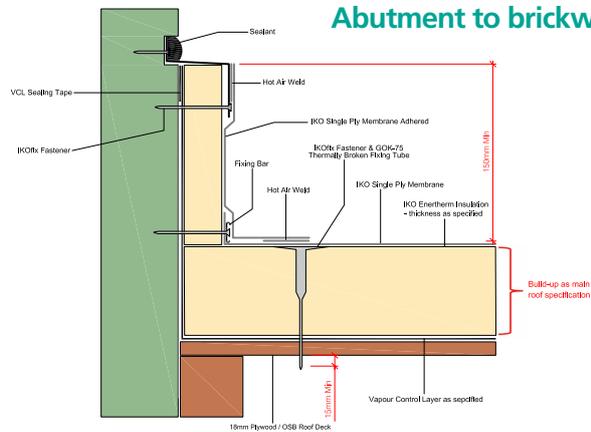
These pages show a number of typical details. The detailing stage of a roof waterproofing project is an essential final element that will present an aesthetically pleasing roof and also ensure a watertight finish. It is paramount when designing any waterproofing system that details are formed in accordance with BS 6229.

Waterproofing to parapets

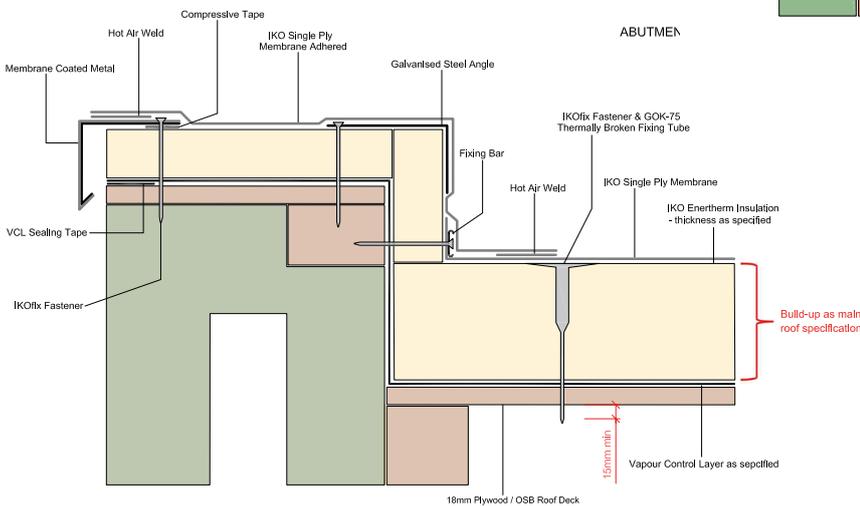
For further information or expert advice concerning details please contact the IKO Technical Services Department on 01257 488 012 or email technical@ikogroup.co.uk



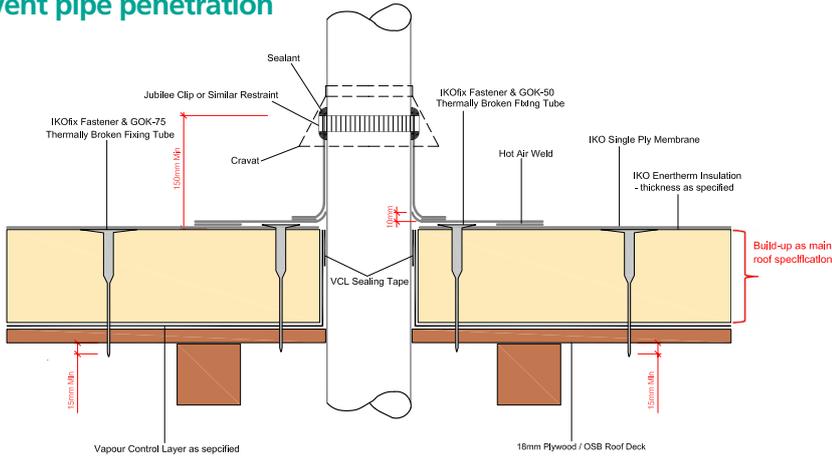
Abutment to brickwork



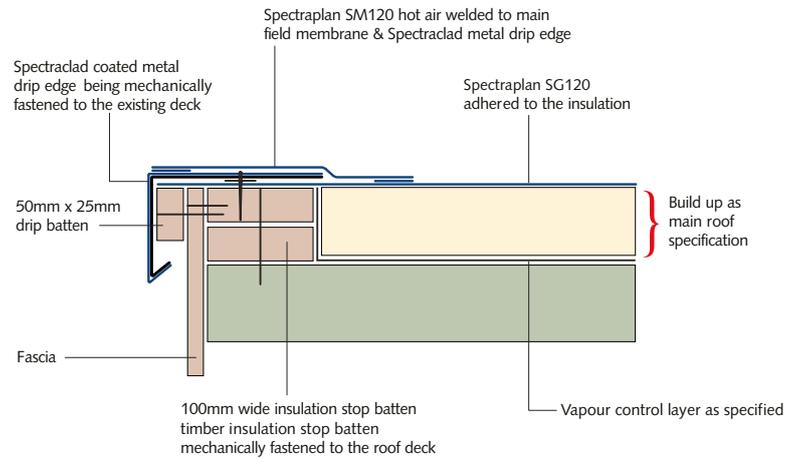
Check kerb



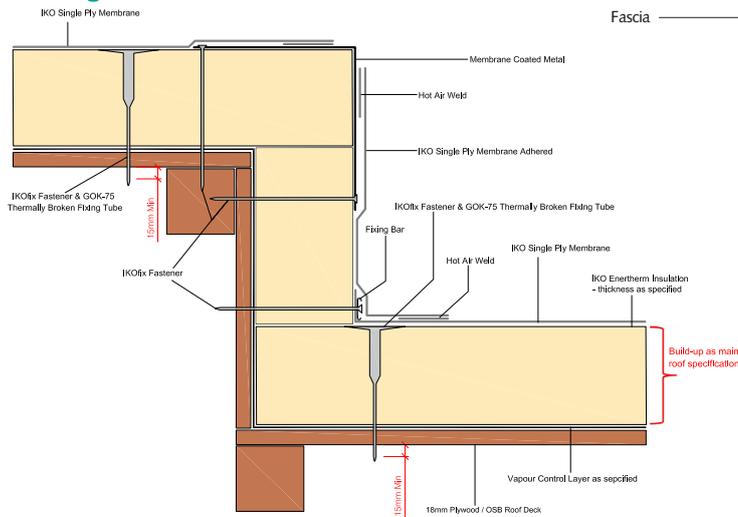
Vent pipe penetration



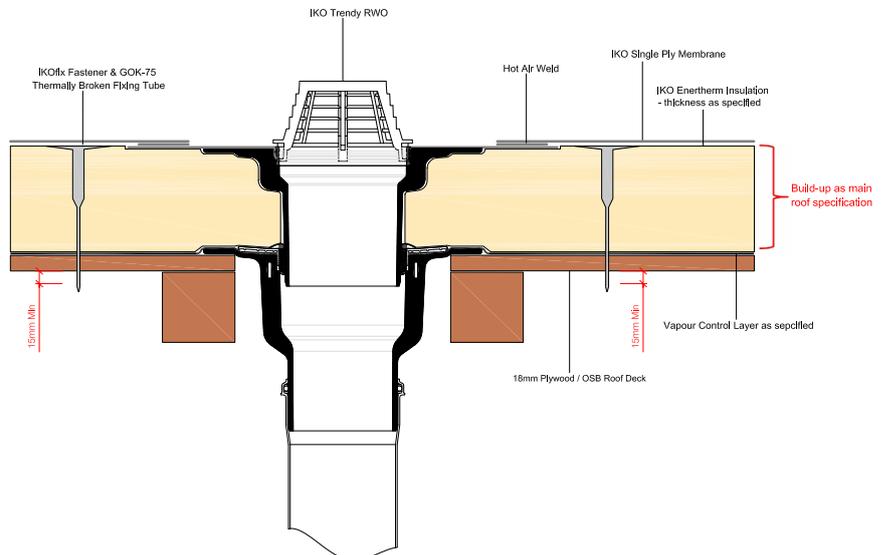
Drip edge



Change in level



Roof drain



References

Some additional reference information

British/European Standards

BS 6229: 2003, Code of Practice for flat roofs with continuously supported coverings

BS EN 12056: 2000, Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation

BS 5250: 2002, Code of Practice for control of condensation in buildings

BS 8000 Part 4: 1989, Workmanship on building sites. Code of Practice for waterproofing

BS EN 1991-1-4:2005, Eurocode 1: Actions on Structures - Part 1-4: General actions - wind action

BS EN 13501-5:2005, Fire classification products and building elements

Building Regulations

www.planningportal.gov.uk

Approved Document L1 and L2 2000 (2013 amendment) - Conservation of Fuel and Power

Approved Document H 2000 (2002 amendment) - Drainage and Waste Disposal

Approved Document B - Volumes 1 and 2 (2006 Edition) - Fire safety

Certification Bodies

British Board of Agrément

www.bbacerts.co.uk

Building Research Establishment

www.bre.co.uk

Loss Prevention Certification Board (Red Book)

www.redbooklive.com

 n55Plus



 gro



 NHBC



 SPRA
Membrane Manufacturer



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