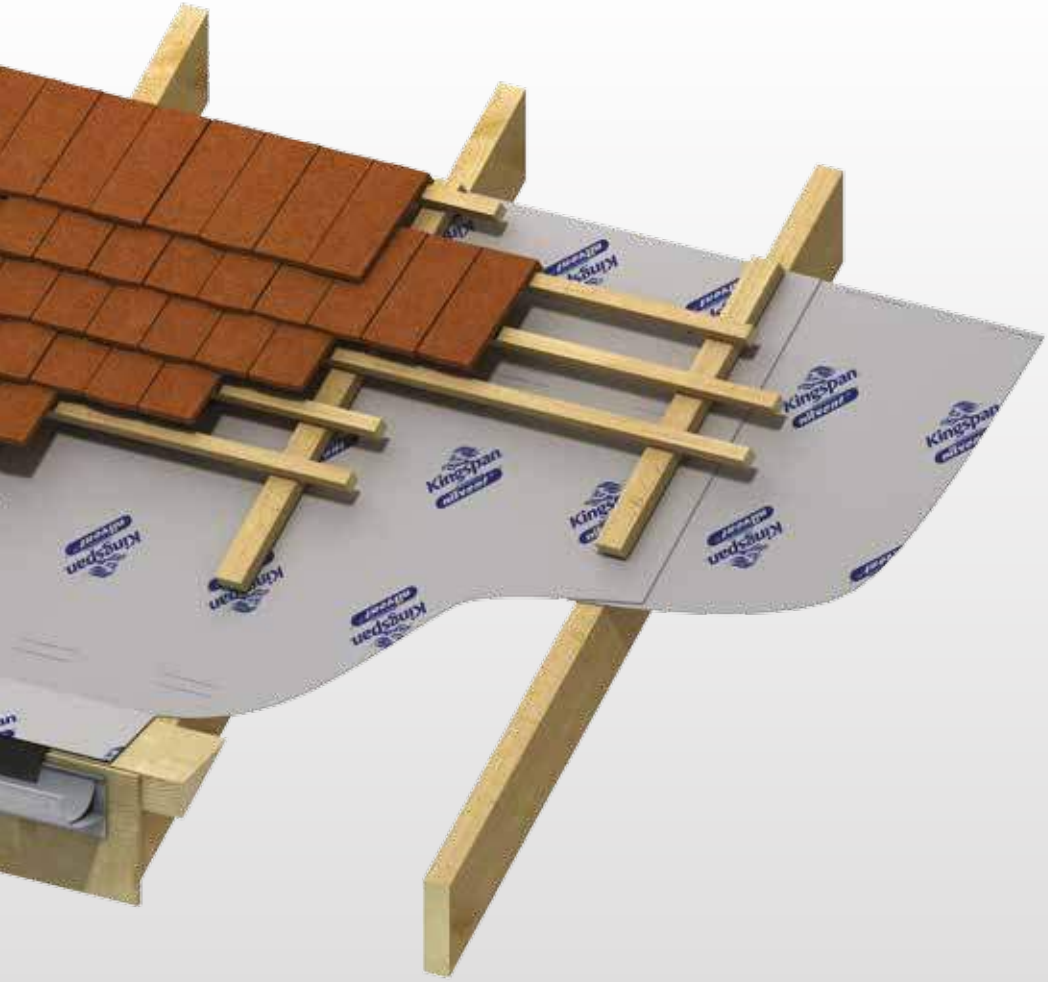
CI/SfB (27.9) Ln6 L3
Seventh Issue September 2017

nilvent®

BREATHABLE MEMBRANE FOR UNVENTILATED PITCHED ROOFS AND TIMBER FRAME WALLS



- Waterproof – can be used as a temporary roof covering
- Non–tenting
- Airtight at normal building pressures
- Excellent water vapour permeability
- Strong – excellent nail tear and tensile strengths
- Quiet under wind loading
- Durable – heat and UV stable
- Lightweight
- Easy to handle and install
- Ideal for new build

Kingspan®

Low Energy – Low Carbon Buildings

Typical Constructions

Pitched Roofs

Horizontal Installation on a Continuous Substrate

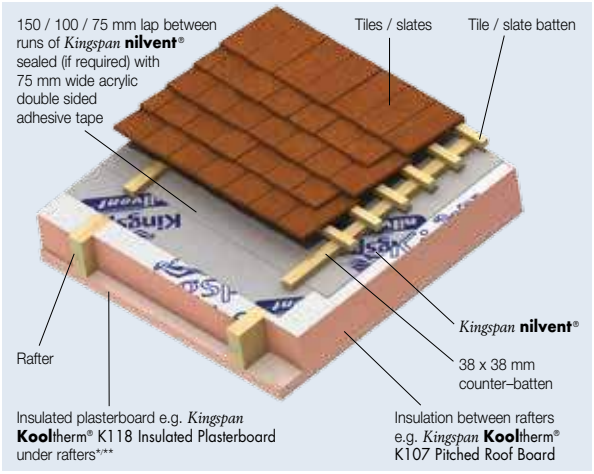


Figure 1a – Fully Filled Insulation Between Rafters – No Sarking Board – Battens & Tiles

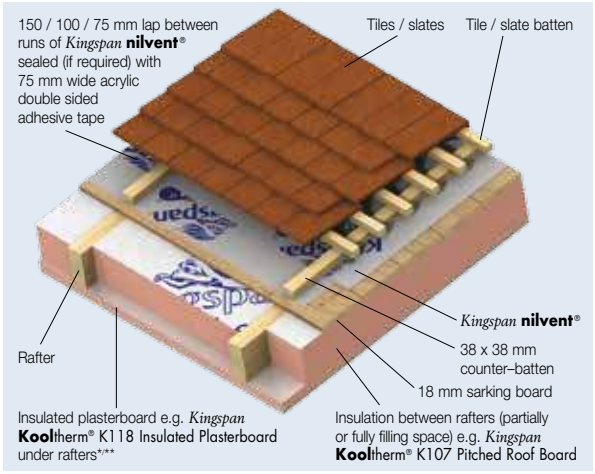


Figure 1c – Insulation Between Rafters – Sarking Board – Battens & Tiles

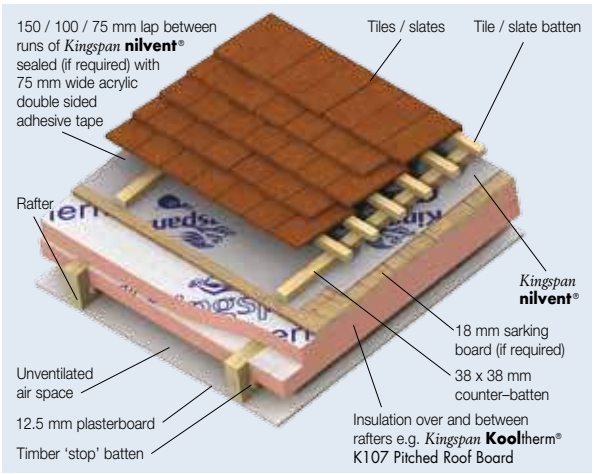


Figure 1b – Insulation Over Rafters – Sarking Board / No Sarking Board – Battens & Tiles

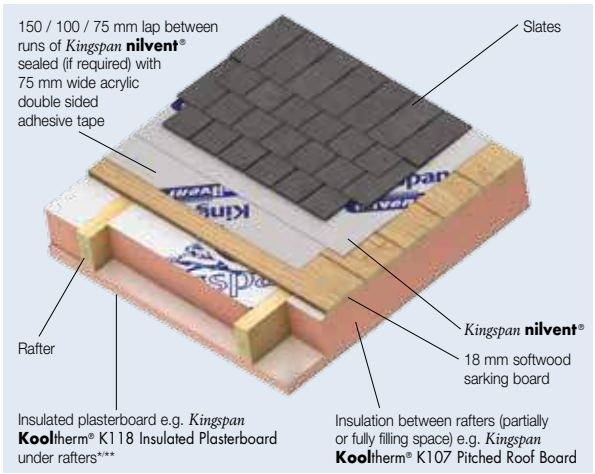


Figure 1d – Insulation Between Rafters – Sarking Board & Natural Slates

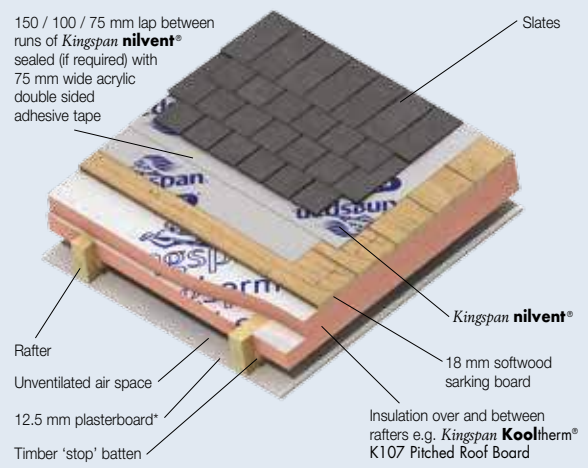


Figure 1e – Insulation Over Rafters – Sarking Board and Natural Slates

Vertical Installation on a Discontinuous Substrate

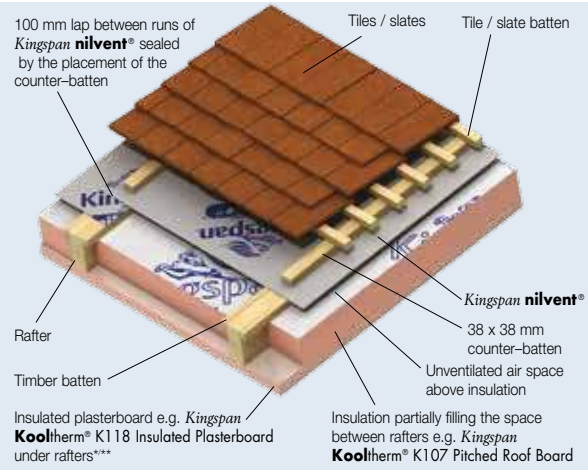


Figure 2 – Partially Filled Insulation Between Rafters – No Sarking Board – Battens & Tiles

Horizontal Installation on a Discontinuous Substrate

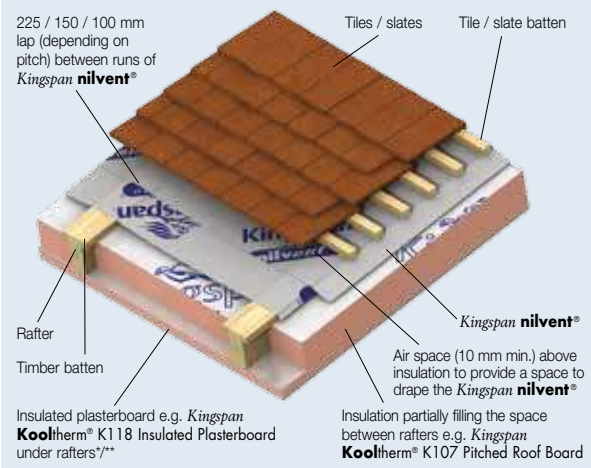


Figure 3a – Partially Filled Insulation Between Rafters – No Sarking Board – Battens & Tiles

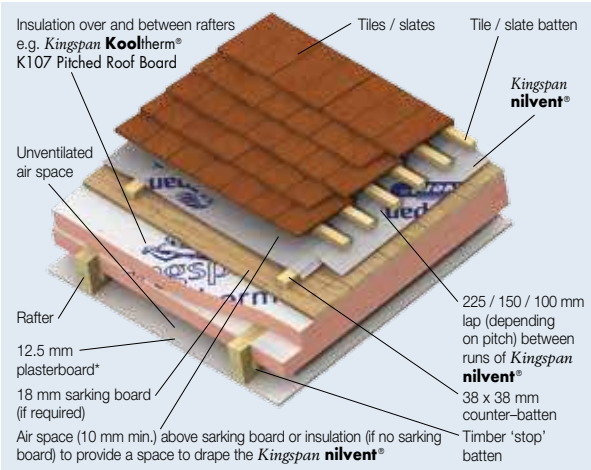


Figure 3b – Insulation Over Rafters – Sarking Board / No Sarking Board – Battens & Tiles

Typical Constructions

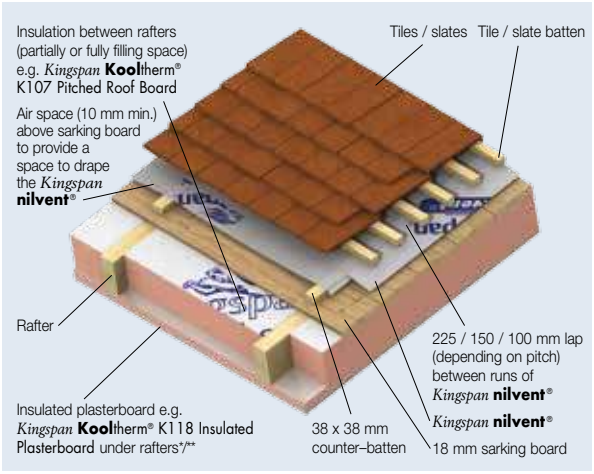


Figure 3c – Insulation Between Rafters – Sarking Board – Battens & Tiles

* *The requirement for a vapour control layer and / or under the tile ventilation should be assessed to BS 5250: 2002. Vapour check plasterboard or a separate vapour control layer can be used as preferred.*

** *Kingspan* **Kool**therm® K118 Insulated Board *contains an integral vapour control layer which, with appropriate detailing at joints, penetrations and wall perimeters, can increase the vapour resistance of the roof lining.*

Timber Frame Walls

Horizontal Installation

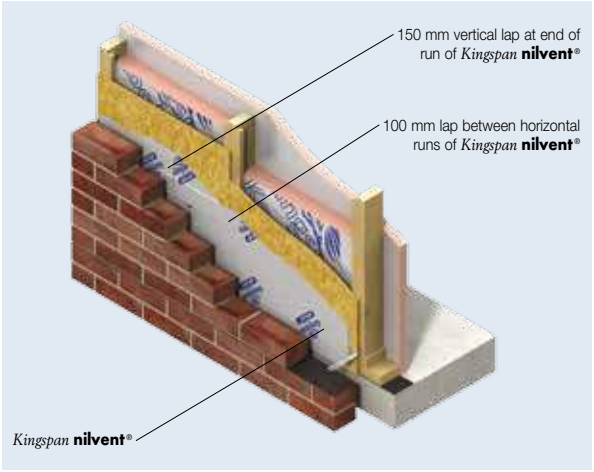


Figure 4 – External Masonry

Vertical Installation

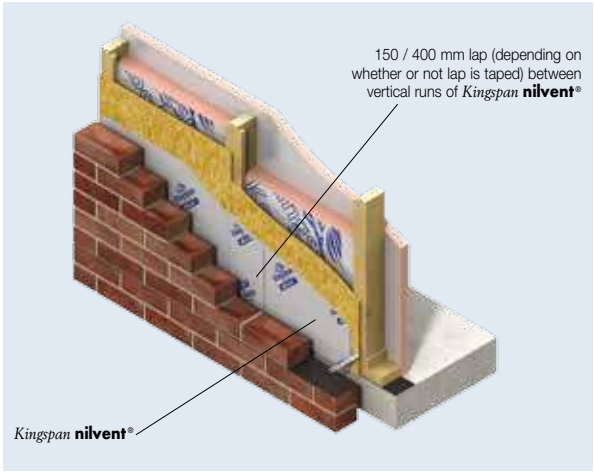


Figure 5a – External Masonry

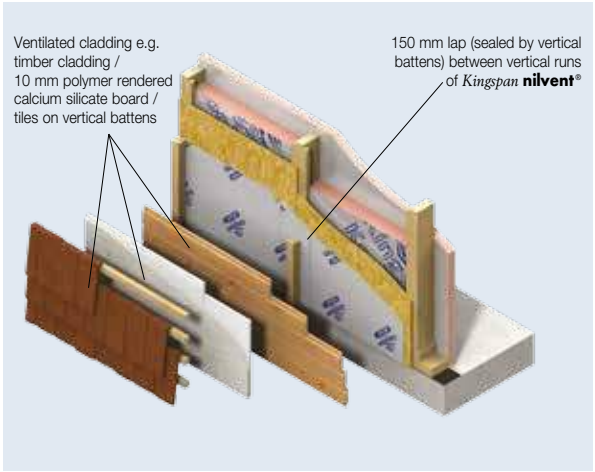


Figure 5b – Ventilated Cladding

Design Considerations

Sustainability & Responsibility

Kingspan Insulation has a long–term commitment to sustainability and responsibility: as a manufacturer and supplier of insulation products; as an employer; as a substantial landholder; and as a key member of its neighbouring communities.

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's British operations at its Pembridge, Herefordshire and Selby, North Yorkshire manufacturing facilities is available at www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan **nilvent**® should be described in specifications as:–

The breathable membrane shall be *Kingspan* **nilvent**® comprising a laminated 3–layer polyolefin construction. The product shall be manufactured under a management system certified to ISO 9001: 2008 and ISO 14001: 2004, and shall be applied in accordance with the instructions issued by Kingspan Insulation Limited.

NBS Specifications

Details also available in NBS Plus.
NBS users should refer to clauses:
H21 130, H30 350, H31 280, P10 320 (Standard and Intermediate)
H21 20, H30 50, H31 55, P10 65 (Minor Works)

Building Information Modelling (BIM)

Kingspan Insulation's BIM objects can be downloaded in Revit and in IFC formats. For more information please visit www.kingspaninsulation.co.uk/bim.

Pitched Roofs

Horizontal Installation on a Continuous Substrate

In these cases, the breathable sarking membrane is installed either under counter–battens, which provide a channel for water drainage (Figures 1a–1c), or, in situations with a sarking board under a natural slate roof, directly under the slates (as neither tile battens nor counter–battens are used) (Figures 1d and 1e).

The membrane is laid taut, and joints between runs of membrane are sealed with tape, if required.

Vertical Installation on a Discontinuous Substrate

Kingspan **nilvent**® is installed in vertical runs, from eaves to eaves, in one length, under counter–battens (see Figure 2). Installed in this way there will be no laps along the length of a run and laps between runs can be formed over a rafter, where counter–battens can secure them and make an airtight joint. The membrane should be laid taut, with no valleys between rafters.

NB It is theoretically possible to install the membrane vertically with a valley between rafters, however this adds no technical benefit, will prove cumbersome, and has the disadvantage of allowing greater wind induced membrane movement (see section on 'Wind Induced Membrane Movement').

Horizontal Installation on a Discontinuous Substrate

In situations where there is no continuous surface (see Figures 3a–3c), the breathable sarking membrane can be draped over the rafters or counter–battens, to provide a channel for water drainage. There should be a minimum 10 mm gap, between the membrane and the tile / slate batten, to afford a drainage channel for any penetrating rain. No counter–batten is required above the *Kingspan* **nilvent**® as water can freely drain under the tile / slate battens.

NB It is possible to have the membrane laid taut with counter–battens above. This is not as practical and incurs the cost penalty of extra counter–battens. It does, however, have the advantage of allowing reduced wind induced membrane movement (see section on 'Wind Induced Membrane Movement').

In these situations, it may not be practical to seal the laps between the runs of *Kingspan* **nilvent**®, and the roof should be considered as being unsealed.

General

Kingspan **nilvent**® meets all of the recommendations and requirements for underlays detailed in BS 5534: 2014 + A1: 2015 (Slating and tiling for pitched roofs and vertical cladding. Code of practice) and NFRC Technical Bulletin 6.

Design Considerations

Waterproofing

If installed as per the instructions given in this document, *Kingspan* **nilvent**® will give a watertight structure under normal weather conditions. *Kingspan* **nilvent**® can be safely used, even in constructions with a large number of nail penetrations through the membrane, e.g. where natural slates are nailed directly into a sarking board.

Ventilation and Condensation Risk

Most buildings contain air that is more humid than the air outside of that building. This humidity differential drives the moisture from the inside to the outside of a building's structure. When the moisture is confronted with a relatively cold and impermeable layer it may condense. In pitched roofs, sarking felt can be such a layer.

The traditional way of avoiding the risk of condensation in roofs, is to ventilate the moisture away, by introducing airflow directly above the insulation layer and below the sarking felt. Modern remedies for roofs include the use of breathable sarking membranes to replace sarking felt.

Breathable sarking membranes negate the need for ventilation directly above the insulation layer. They do this because they have a low vapour resistance, which allows water vapour to escape through the breathable membrane to the outside of the building. Studies have shown that ventilation directly above an insulation layer can reduce its thermal efficiency.

BS 5250: 2011 + A1: 2016 (Code of practice for control of condensation in buildings) defines a breathable membrane as a membrane with a vapour resistance that must not exceed 0.60 MN·s/g. It further sub–defines breathable membranes into two types: HR breathable membranes have a vapour resistance > 0.25 MN·s/g; and LR breathable membranes have a vapour resistance that must not exceed 0.25 MN·s/g. *Kingspan* **nilvent**® is an LR underlay, as defined by BS 5250: 2011 + A1: 2016, and has a vapour resistance of 0.10 MN·s/g.

There must be adequate provision, for vapour to disperse to atmosphere, outside of *Kingspan* **nilvent**®.

For horizontal installation on a continuous substrate and for vertical installation, Kingspan Insulation recommends the use of minimum 25 mm thick counter–battens over the breathable sarking membrane, to create an airspace, between the breathable membrane and the tile / slate battens, large enough to encourage air movement. They also allow the dust and debris from tiling and slating to slide down the slope and emerge at the eaves. The use of counter–battens also makes it easier to achieve interconnecting airspaces at interruptions to the main roof area – such as roof windows, chimneys, dormers, hips, and valleys.

For horizontal installation on a discontinuous substrate, counter–battens are not necessary to provide air movement. As long as *Kingspan* **nilvent**® is draped such that there is a minimum 10 mm gap between the membrane and the tile / slate batten, the void so created will be sufficient.

With some roof coverings (e.g. pantiles, natural slates and cambered plain tiles), irregularities in their surfaces should allow sufficient natural ventilation to remove moisture from the space above the breathable membrane. With other roof coverings (e.g. sheet metal, interlocking tiles and artificial slates), provision of vents to encourage ventilation may be necessary.

Natural slates nailed through *Kingspan* **nilvent**® into a sarking board, without counter–battens or slate battens, provide for enough air movement to disperse vapour because of the gaps created by their irregularity. Artificial slates may not be suitable for direct fixing to a sarking board, because the regularity of their shape may not provide for enough air movement to disperse vapour. It may be necessary to put counter–battens and slate battens in place under artificial slates, to provide an airspace for ventilation.

Ventilation beneath the underlay is not required, and should be avoided.

Airtightness & Sealed vs. Unsealed Constructions

As we drive for buildings with lower and lower U–values, in order to save on wasteful heat losses, the component of heat lost from a building directly through its fabric becomes less, as a proportion of total heat lost. The proportion lost by accidental air–leakage becomes more significant. This air–leakage is not the same as deliberate ventilation. This accidental air–leakage into a roof can be lessened by sealing the roof construction to make it as airtight as possible.

Research has proven that a sealed roof approach yields a more energy efficient roof, as the impacts of incidental infiltrating cold air are negated. Therefore, if creating an unventilated roof, it is preferable to fully seal all joints in the breathable sarking membrane with tape. 75 mm wide acrylic double sided adhesive tape should be used for sealing joints in *Kingspan* **nilvent**®.

However, there is limited point in carefully sealing a roof structure if the specified breathable membrane is not airtight. *Kingspan* **nilvent**® is airtight at normal building pressures.

The ideal is to install *Kingspan* **nilvent**® in a manner that is practical, and maximises the ability to achieve an airtight construction.

The use of horizontal runs of *Kingspan* **nilvent**® is by far the most practical method of installation, however, it is difficult to achieve airtightness unless the *Kingspan* **nilvent**® is to be laid onto a continuous surface (see Figures 1a–1e). The taping of breathable membrane joints is considerably easier to achieve if this is the case.

The use of vertical runs of *Kingspan* **nilvent**® is not as practical a method of installation as horizontal runs, however, it is easy to achieve airtightness as the laps between runs are sealed by the counter–battens that are installed over them (see Figure 2).

If the sealing of the roof is deemed to be unimportant, horizontal installation without sealing joints with tape will always be the most practical solution, regardless of whether it is laid onto a continuous or discontinuous surface (see Figures 1a–1e and 3a–3c). However, it must be stressed that these roof configurations are not recommended, on thermal efficiency grounds.

Wind Induced Membrane Movement
Wind blowing over a pitched roof generates positive and negative air pressures. These air pressures can cause underlays to move up and down. This effect is increased if the underlay is draped rather than installed taut. A roof underlay is required to reduce the wind loading on the tiles / slates, in order to stop them from becoming detached from the roof.

Tile / Slate Damage
Under extreme conditions, if the membrane stretches as it moves up and down, it can knock against the tiles / slates and cause damage. The upward deflection of the underlay, under maximum negative pressure, must be small enough to avoid contact with the underside of the tiles / slates.

Kingspan **nilvent**® has mechanical properties sufficient to prevent this effect, given the wind uplift forces prevalent in the UK and Ireland.

Wind Noise
Under extreme conditions, underlays can produce a noise, irritating to occupants, as they move up and down. *Kingspan* **nilvent**® is quiet under wind loading.

Mansard Roofs / Walls
Kingspan **nilvent**® can be used for the construction of insulated tiled or slated mansard roofs / walls. Its installation procedures are identical to those for pitched roofs.

Timber Frame Walls

Installation
Kingspan **nilvent**® may be installed in horizontal or vertical runs. In both cases, upper layers must overlap lower layers, so water is shed away from the ply, OSB, or insulation sheathing.

The membrane is fixed taut, and joints between runs of membrane are sealed with tape, if required.

Waterproofing
Kingspan **nilvent**® resists windblown rain and snow, and will protect the sheathing and timber frame from external moisture penetration. The product can be used as a temporary weather protection during construction, prior to the completion of external brickwork or cladding. This time period must be limited to two months, as *Kingspan* **nilvent**® is not resistant to long term UV exposure.

Ventilation and Condensation Risk
Condensation can be controlled, in timber frame walls, by ensuring there is a layer of high vapour resistance on the warm side of the insulation. The vapour resistance of the wall lining can be increased by the use of: a vapour check plasterboard*, the use of *Kingspan* **Kool**therm® K118 Insulated Plasterboard, which contains an integral vapour control layer*, a layer of polythene sheeting*, or by the application of two coats of Gyproc Drywall Sealer, if required.

** With appropriate detailing at joints, penetrations and wall perimeters.*

A breathable membrane with low vapour resistance, e.g. *Kingspan* **nilvent**®, allows any moisture that does penetrate the construction to escape to the outside of the building.

A condensation risk analysis should be carried out following the procedures set out in BS 5250: 2011 + A1: 2016 (Code of practice for the control of condensation in buildings). The Kingspan Insulation Technical Service Department (see rear cover) can provide this service.

Fire Stops

Current Building Regulations / Standards should be considered with regard to the requirements for, and provision of, fire stops.

Lightning Protection

Building designers should give consideration to the requirements of BS / I.S. EN 62305: 2011 (Protection against lightning).

Sitework

Pitched Roofs

Horizontal Installation on a Continuous Substrate

- Start installation at the eaves.
- Fit an eaves strip, of a UV–resistant material, to overhang the eaves / fascia by 50–60 mm.
- Lap the *Kingspan* **nilvent**®, logo–up, over the eaves strip (if required), with the bottom edge of the *Kingspan* **nilvent**® in line with the top of the fascia.
- *Kingspan* **nilvent**® should be laid taut.
- Temporarily fix in place with clout nails, and cut to length with a sharp knife.
- The second run of *Kingspan* **nilvent**® should lap over the top of the first, by the distance shown in the table below.

Rafter pitch (degrees)	Minimum lap (mm)
12.5 – 14	150
15 – 34	100
≥ 35	75

- The printed tramlines on the top surface of *Kingspan* **nilvent**® indicate a distance of 150 mm.
- Use 75 mm wide acrylic double sided adhesive tape to seal horizontal laps between runs of *Kingspan* **nilvent**® (unless otherwise specified).
- Vertical laps between lengths of *Kingspan* **nilvent**® should be not less than 100 mm wide, and be positioned so as to coincide with a rafter position.
- These laps will be secured and sealed by the later fixing of the counter–battens.
- Avoid vertical laps over the same rafter position, in successive runs of *Kingspan* **nilvent**®.

NB In constructions with a sarking board under a slated roof with no counter–battens or slate battens, the vertical laps are taped with 75 mm wide acrylic double sided adhesive tape, and fixed in place with clout nails.

- Continue installation up the roof, in the same manner, to the ridge. Install counter–battens (min. 25 mm deep) and tile / slate battens, in the usual manner, as proves necessary to fully fix the *Kingspan* **nilvent**® in place, and to provide a support for moving up the roof.
- Lap over the ridge by not less than 150 mm each side (total overlap of 300 mm).
- Complete the installation of counter–battens and tile / slate battens over the whole area installed.

NB In constructions with a sarking board under a slated roof with no counter–battens or slate battens, Kingspan **nilvent**® *is laid over the whole roof using roof ladders or similar for access prior to slating.*

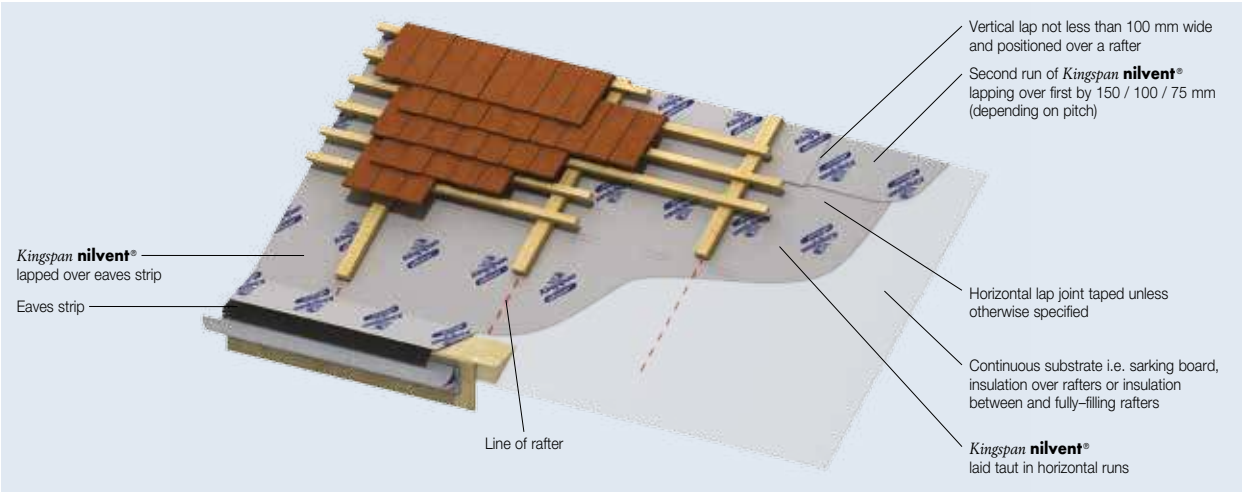


Figure 5c Eaves – Fully Supported Horizontal Installation

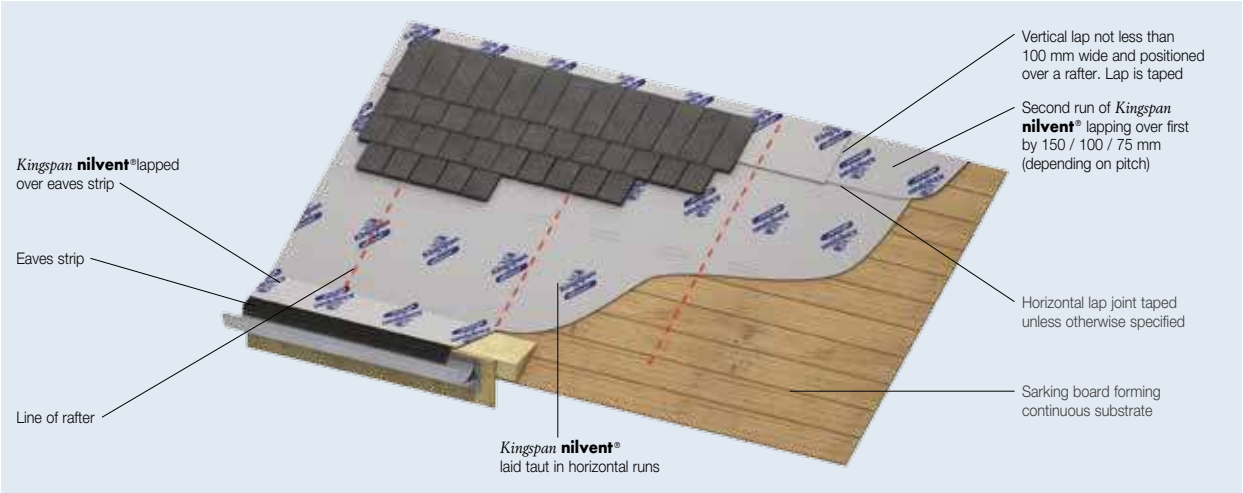


Figure 5d Eaves – Fully Supported Horizontal Installation with Natural Slates

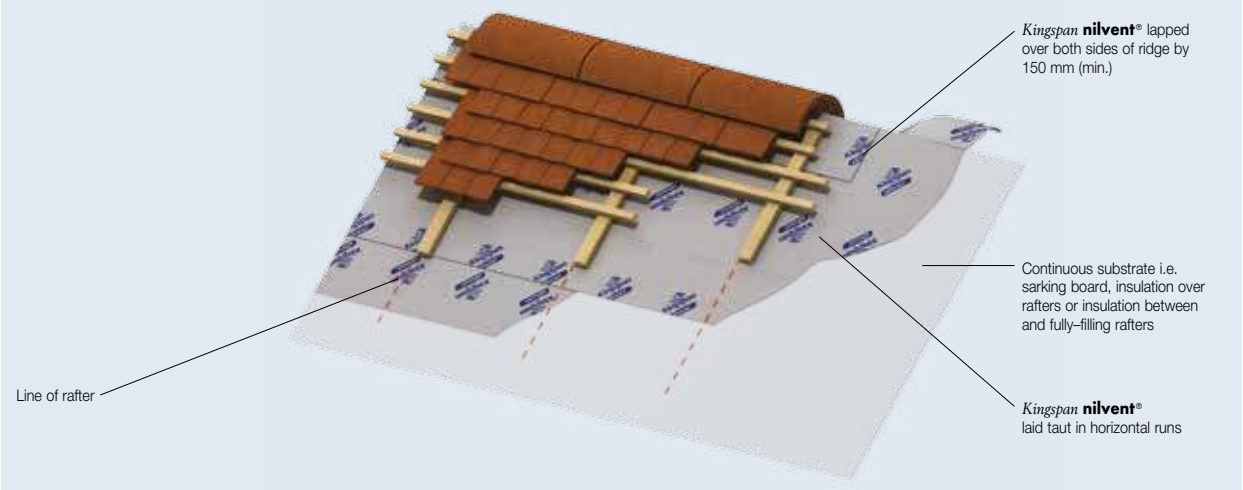


Figure 5e Ridge – Fully Supported Horizontal Installation

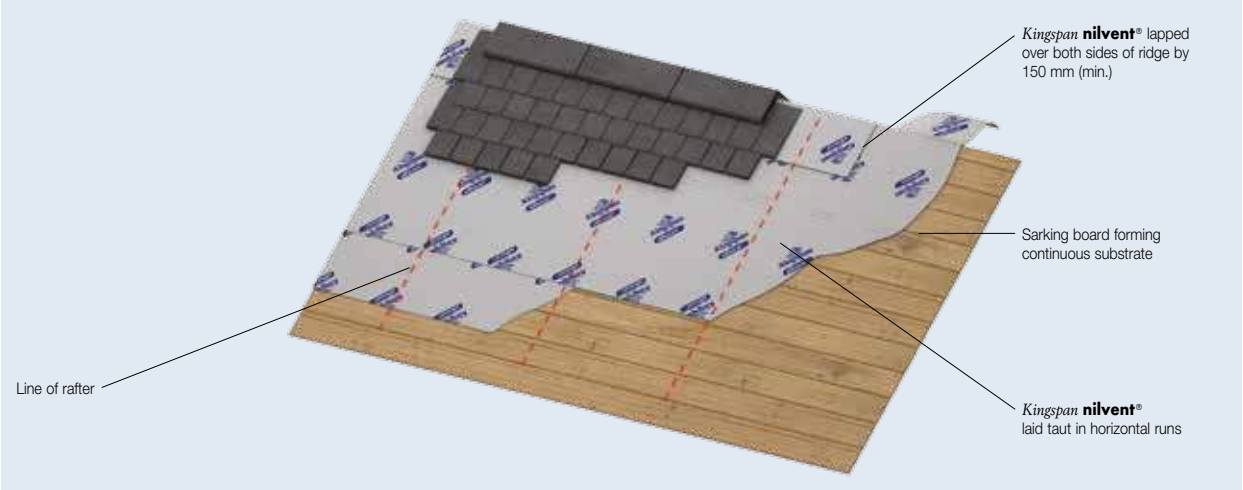


Figure 5f Ridge – Fully Supported Horizontal Installation with Natural Slates

Vertical Installation on a Discontinuous Substrate

- For ease of installation, thread a wood or metal bar through the core of the *Kingspan* **nilvent**® roll, and set it on bearers on the scaffold platform.
- The leading edge of the *Kingspan* **nilvent**® can then be taken up and over the ridge, and down to the opposite eaves.
- Fit an eaves strip, of a UV–resistant material, to overhang the eaves / fascia by 50–60 mm.
- Lap the *Kingspan* **nilvent**®, logo–up, over the eaves strip (if required), with the bottom edge of the *Kingspan* **nilvent**® in line with the top of the fascia. *Kingspan* **nilvent**® should be laid such that it is taut in both horizontal and vertical directions.
- Each run of *Kingspan* **nilvent**® should be installed in a single piece from eaves to eaves.
- Temporarily fix in place with clout nails, cut to length with a sharp knife, move sideways and repeat the process.
- The second run of *Kingspan* **nilvent**® should lap over the first by not less than 100 mm, and be positioned so that the lap coincides with a rafter position.
- The printed tramlines on the top surface of *Kingspan* **nilvent**® indicate a distance of 150 mm.
- These laps should be secured and sealed by the fixing of counter–battens (min. 25 mm deep), as work progresses across the roof. Counter–battens should be fixed through to the rafters below, with fixings at a maximum of 300 mm centres.
- Continue installation across the roof in the same manner, then install tile / slate battens over the whole area installed.

NB Kingspan **nilvent**® *can be laid in a vertical orientation with a drape. However, counter–battens will still be required to give an effective seal. If sealing of the roof is not required, and counter–battens are not specified, it will prove a lot easier to install Kingspan* **nilvent**® *horizontally with a drape (see page 11).*

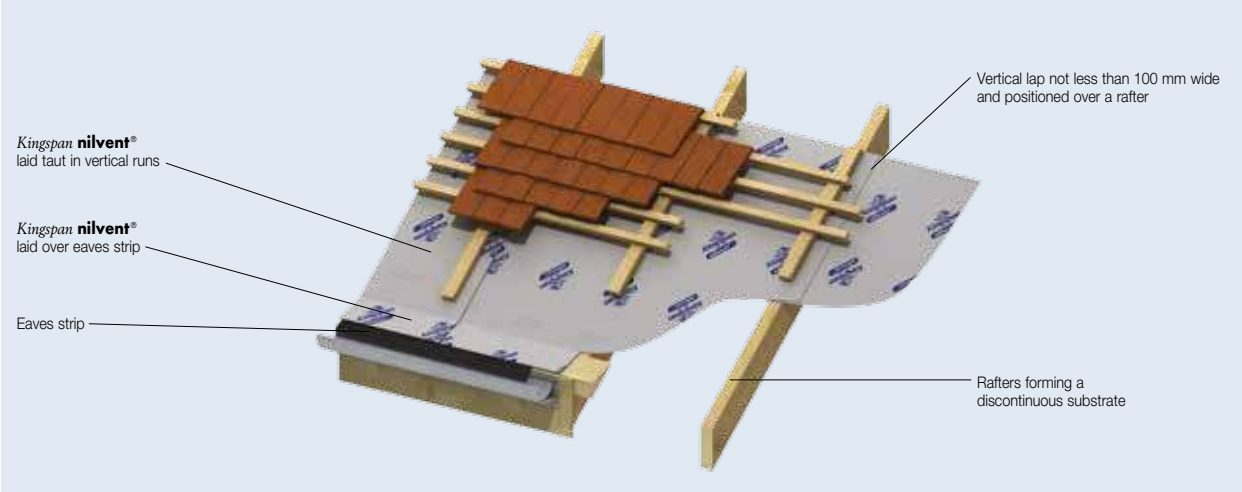


Figure 6a Eaves – Vertical Installation

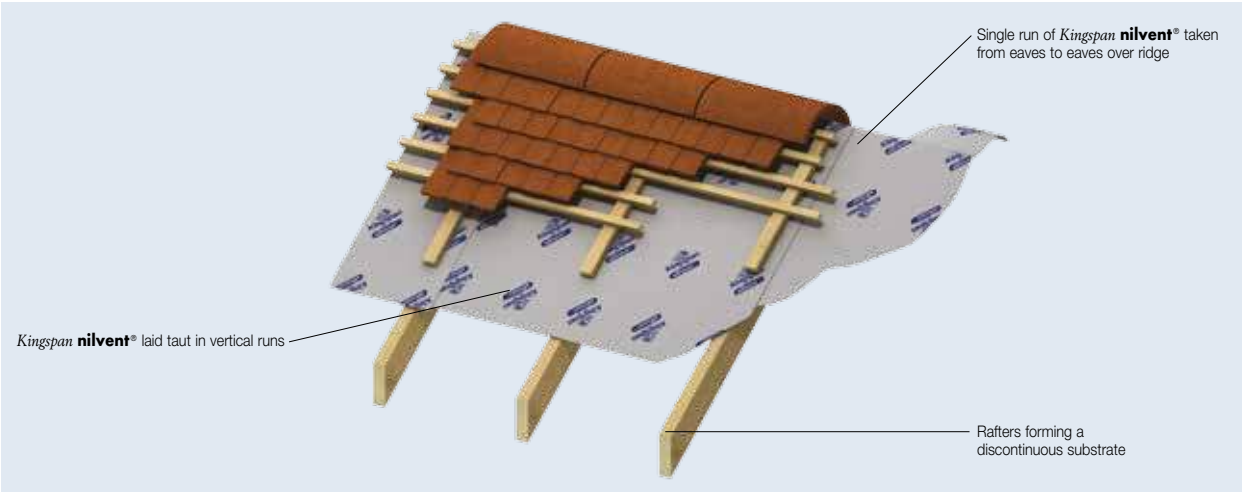


Figure 6b Ridge – Vertical Installation

Horizontal Installation on a Discontinuous Substrate

- Start installation at the eaves.
- Fit an eaves strip, of a UV–resistant material, to overhang the eaves / fascia by 50–60 mm.
- Lap the *Kingspan* **nilvent**®, logo–up, over the eaves strip (if required), with the bottom edge of the *Kingspan* **nilvent**® in line with the top of the fascia.
- *Kingspan* **nilvent**® and the eaves strip should be laid in such a manner as to create a valley between rafters (see Figure 3a) or counter–battens (see Figures 3b–3c), to allow water drainage.
- Temporarily fix in place with clout nails, and cut to length with a sharp knife.
- The second run of *Kingspan* **nilvent**® should lap over the top of the first, by the distance shown in the table below.

Rafter pitch (degrees)	Minimum lap (mm)
12.5 – 14	225
15 – 34	150
≥ 35	100

- The printed tramlines on the top surface of *Kingspan* **nilvent**® indicate a distance of 150 mm.
- It may not be practical to attempt to seal the laps between the runs of *Kingspan* **nilvent**®.
- Vertical laps between lengths of *Kingspan* **nilvent**® should be not less than 100 mm wide, and be positioned so as to coincide with a rafter.
- These laps will be secured and sealed by the later fixing of the tile / slate battens.
- Avoid vertical laps over the same rafter or counter–batten position, in successive runs of *Kingspan* **nilvent**®.
- Continue installation up the roof, in the same manner, to the ridge.
- Install tile / slate battens, in the usual manner, as proves necessary to fully fix the *Kingspan* **nilvent**® in place, and to provide a support for moving up the roof.
- Lap over the ridge by not less than 150 mm each side (total over lap of 300 mm).
- Complete the installation of tile / slate battens over the whole area installed.

NB Kingspan **nilvent**® *can be laid taut without draping on a discontinuous substrate. In which case, install as in the method (shown on page 8) for horizontal installation on a continuous substrate. Effective taping of joints will prove extremely difficult.*

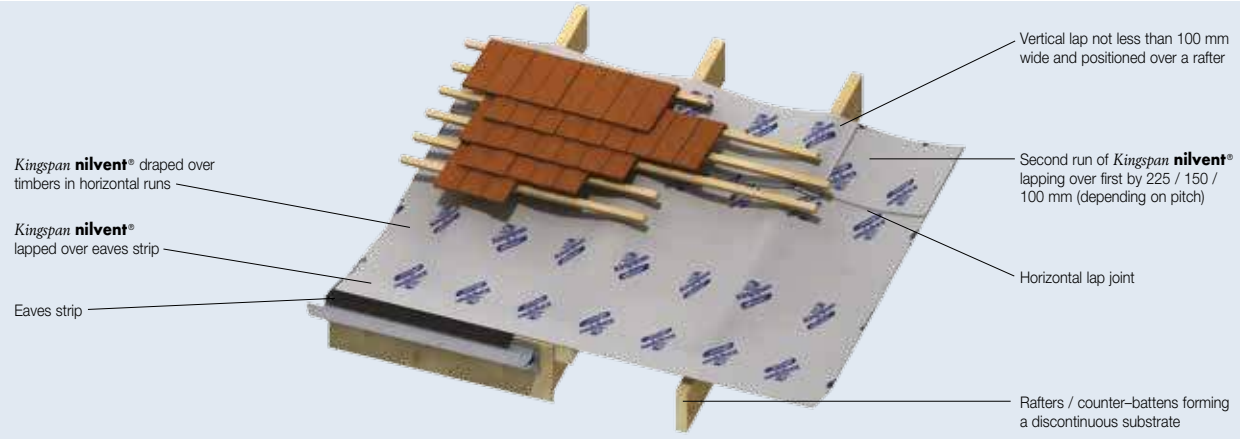


Figure 7a Eaves – Draped Horizontal Installation

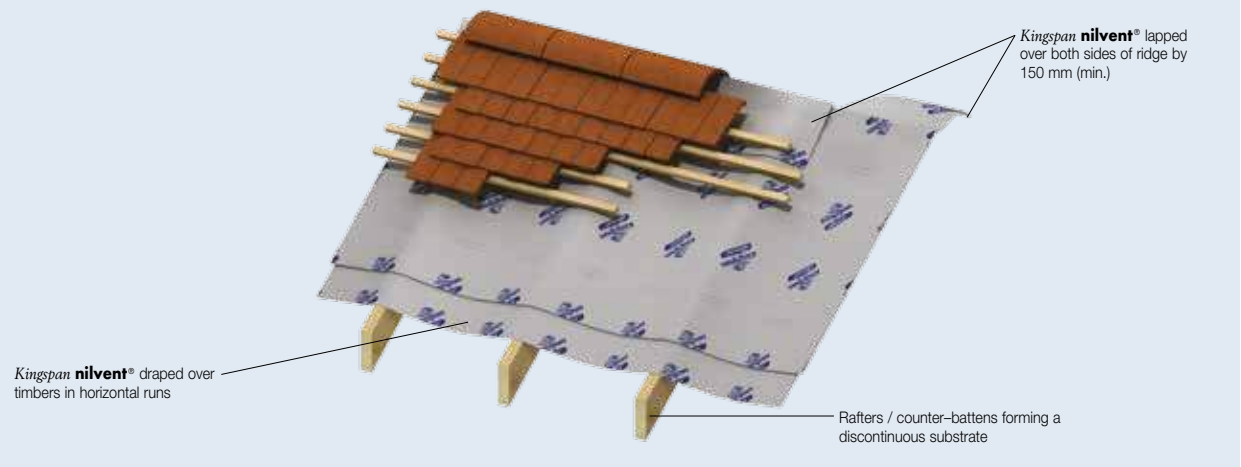


Figure 7b Ridge – Draped Horizontal Installation

Abutments

- At any abutment, chimney stack or similar roof penetration, apply 1.5 mm butyl rubber tape (e.g. glazing tape) to the abutment.
- Turn up the *Kingspan* **nilvent**® at least 50 mm under the flashing, and secure it with a counter–batten / tiling batten, pressed firmly against the abutment, and fixed to the end rafter or trimmer.
- In constructions with a sarking board under a slated roof with no counter–battens or slate battens, the above method is followed without the batten to secure the membrane.

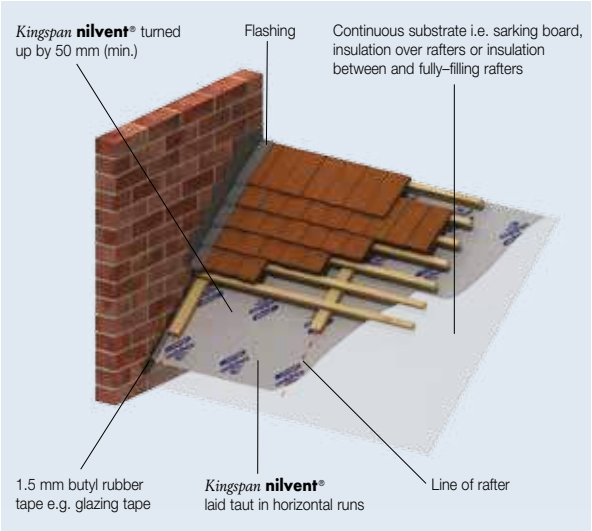


Figure 8a Abutments – Fully Supported Horizontal Installation

Figure 8b Abutments – Fully Supported Horizontal Installation with Natural Slates

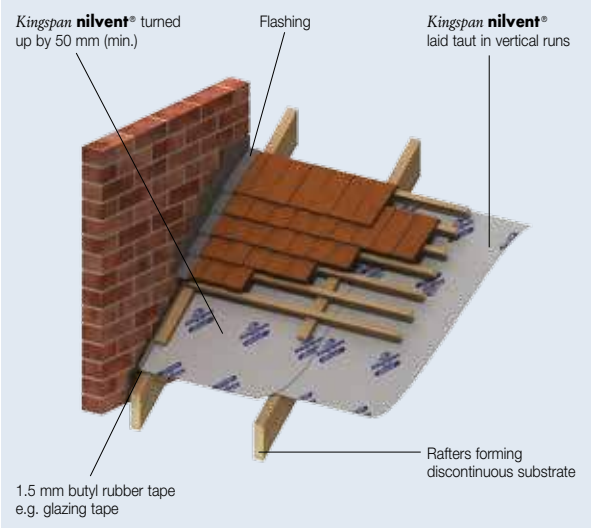


Figure 8c Abutments – Vertical Installation

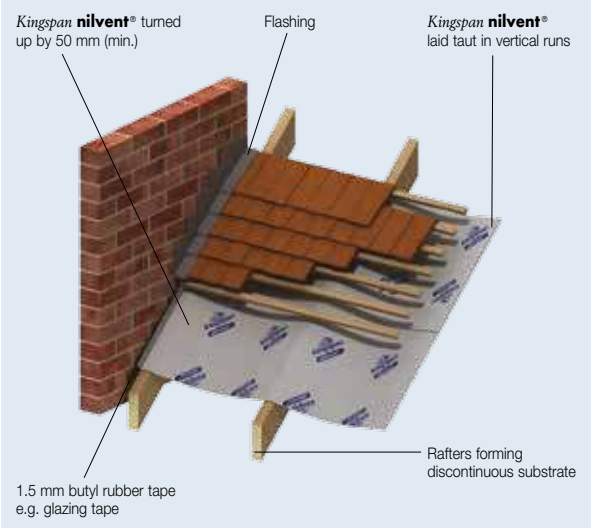


Figure 8d Abutments – Draped Horizontal Installation

Verges

- Extend the *Kingspan* **nilvent**® across the gable wall and overhang.
- Turn it up at least 50 mm behind the fascia board, before fixing with a batten to the flying rafter.
- Where no counter–battens are used, extend the *Kingspan* **nilvent**® across the gable wall and overhang, and extend it to fully cover the undercloak.

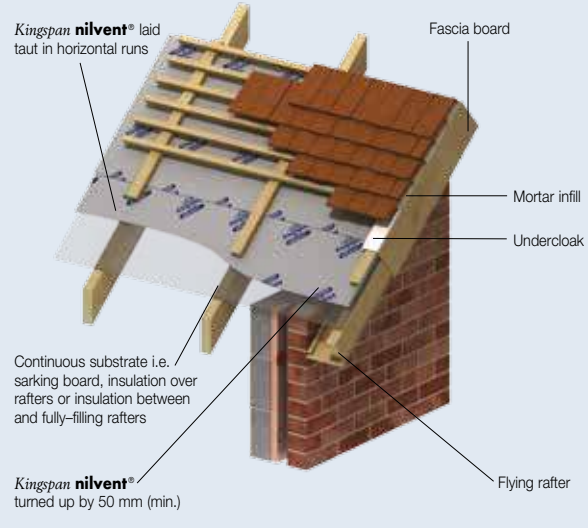


Figure 9a Verges – Fully Supported Horizontal Installation

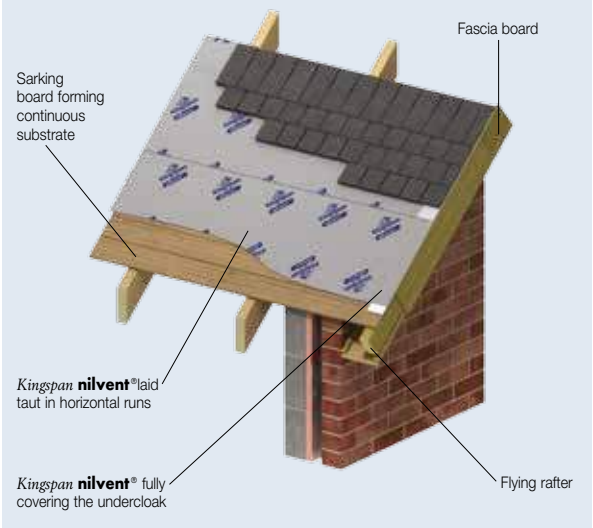


Figure 9b Verges – Fully Supported Horizontal Installation with Natural Slates

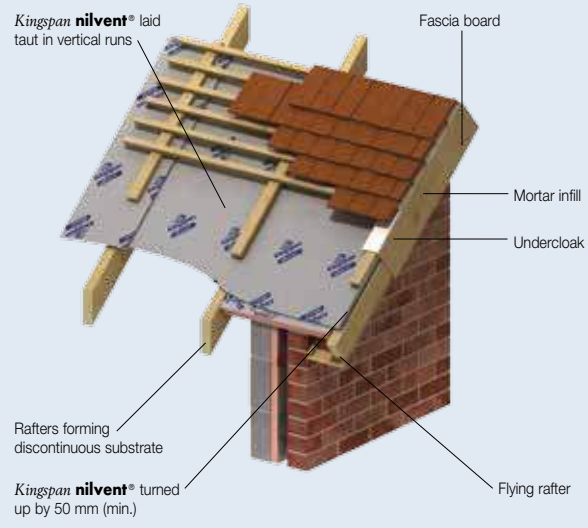


Figure 9c Verges – Vertical Installation

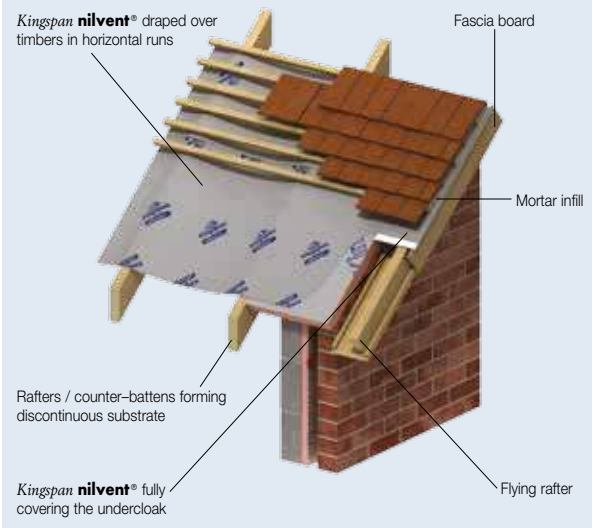


Figure 9d Verges – Draped Horizontal Installation

Hips

- Fit the *Kingspan* **nilvent**® to the hipped end of the roof before covering the main roof area.
- Pull the *Kingspan* **nilvent**® over the hip rafter and trim off the surplus, leaving an overlap of at least 150 mm. Secure in the same manner as for the main roof area.
- Once the hipped end is covered, move round and lay *Kingspan* **nilvent**® on the main roof area.
- Fold over hip rafters, and trim off surplus material.

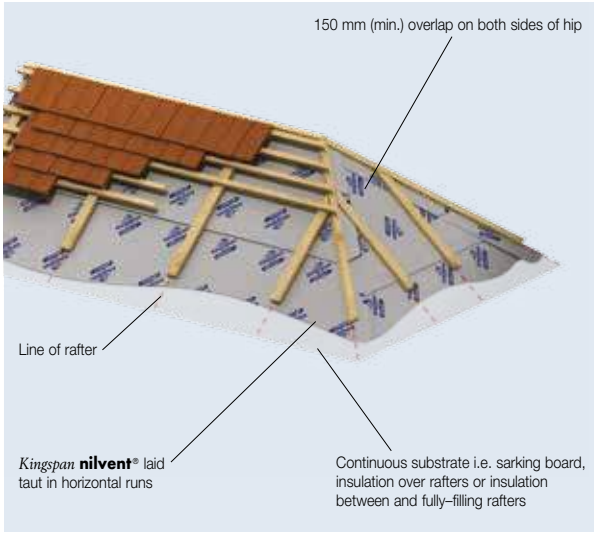


Figure 10a Hips – Fully Supported Horizontal Installation

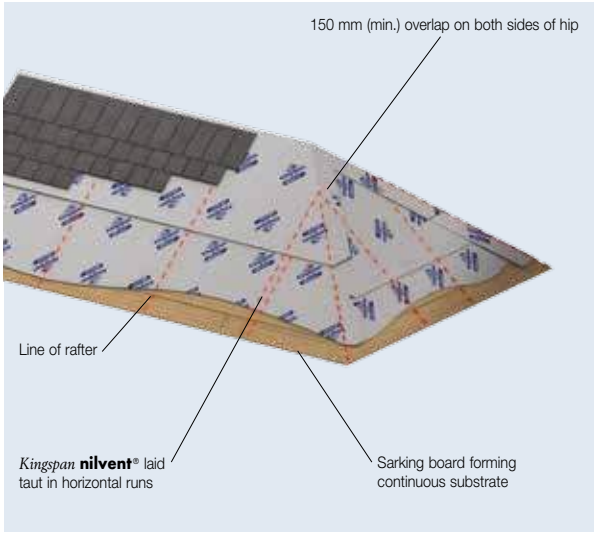
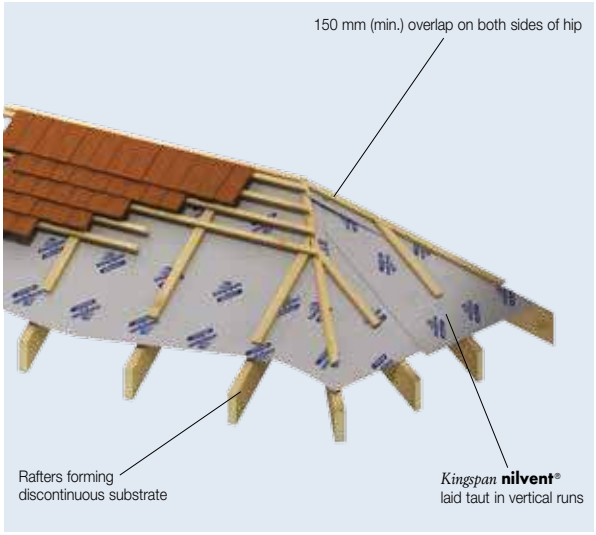


Figure 10b Hips – Fully Supported Horizontal Installation with Natural Slates



10c Hips – Vertical Installation

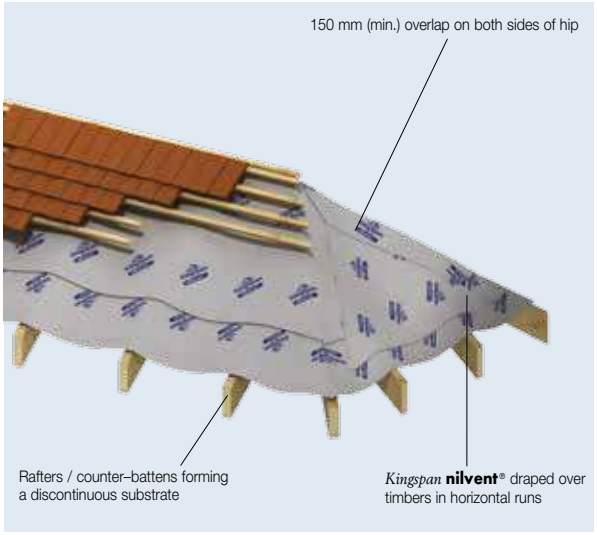


Figure 10d Hips – Draped Horizontal Installation

Valleys

- Lay the *Kingspan* **nilvent**® along the main roof area until you reach the valley.
- Fold the *Kingspan* **nilvent**® into the valley. Trim off surplus leaving not less than 300 mm of material beyond the centre line of the valley.
- Laid in this way there is no need to apply a separate strip of *Kingspan* **nilvent**® in the valley.
- Cut counter–battens (if required) short of the valley, to encourage air movement and allow run–off of any water penetrating the tiles / slates.
- *Kingspan* **nilvent**® forms an excellent underlay beneath zinc, lead or GRP valley gutter liners.

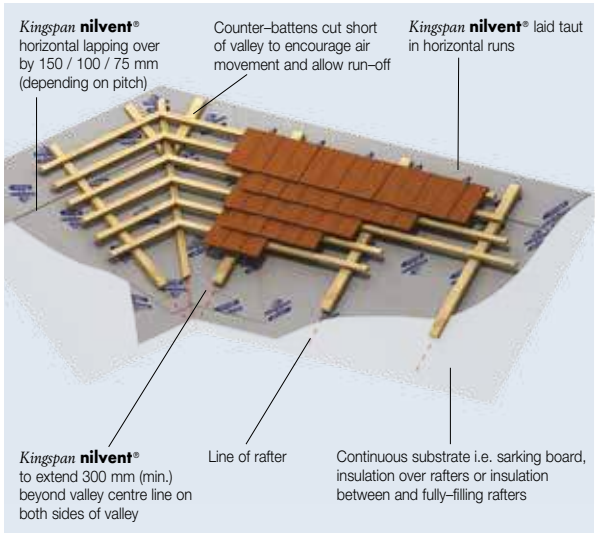


Figure 11a Valleys – Fully Supported Horizontal Installation

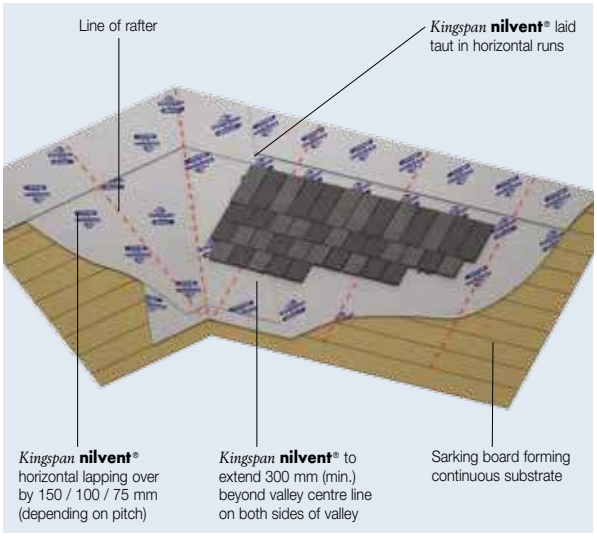


Figure 11b Valleys – Fully Supported Horizontal Installation with Natural Slates

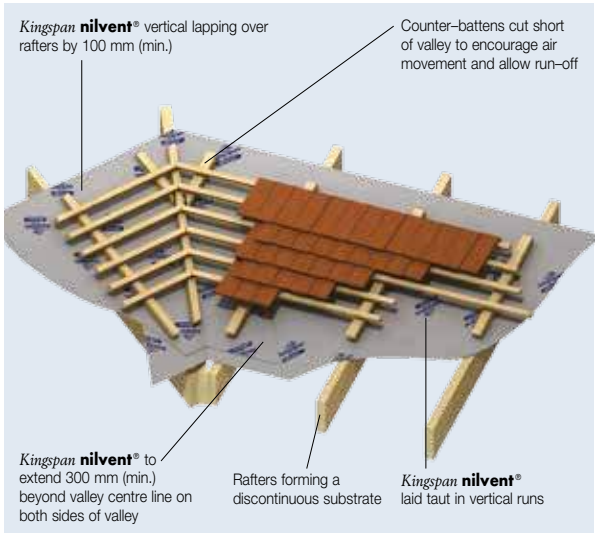


Figure 11c Valleys – Vertical Installation

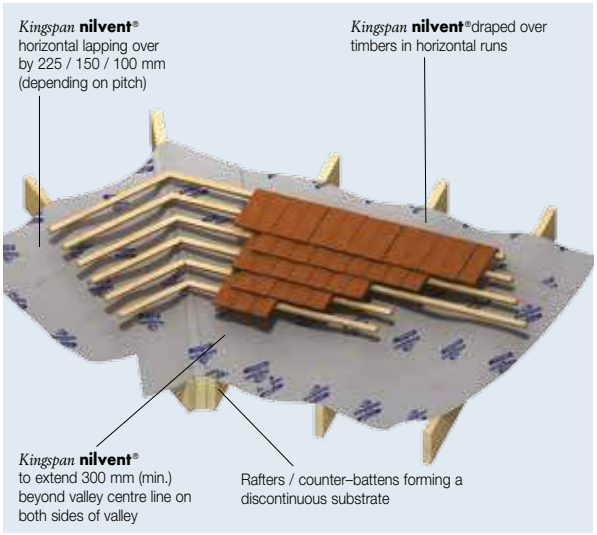


Figure 11d Valleys – Draped Horizontal Installation

Sitework

Rooflights

- Please refer to the instructions provided by the rooflight manufacturer. In the absence of manufacturer's information, cut and fit *Kingspan* **nilvent**® neatly around the rooflight kerb, with an upstand of 50 mm.
- Seal the underlay to the kerb all round, using 1.5 mm butyl rubber tape (e.g. glazing tape).

Slating and Tiling

- Slating and tiling over *Kingspan* **nilvent**® is exactly the same as on any other pitched roof except that, in some instances, the slate / tile battens (if required) are fixed to the previously applied counter–battens.
- It is, however, essential that slate or tiling rubble does not lie in contact with *Kingspan* **nilvent**® as this may facilitate water penetration.

Timber Frame Walls

Fixing

- *Kingspan* **nilvent**® can be fixed to a timber frame wall either horizontally or vertically.
- In both cases, it must be fixed so that upper layers overlap the lower layers by a minimum of 100 mm, so that water is shed away from the sheathing.
- *Kingspan* **nilvent**® must be secured at regular intervals using either nails or staples to prevent damage by wind.
- Nails should comprise galvanized mild steel, austenitic stainless steel, phosphor bronze, or silicon bronze. Staples should comprise austenitic stainless steel.
- The positions of studs should be marked on the face of the *Kingspan* **nilvent**®, usually with tape, to enable fixing of wall ties or battens.
- It is essential that the lowest timbers in the wall are protected by the breather membrane.

Lapping and Jointing

- Horizontal laps should be a minimum of 75 mm.
- For horizontal installation, vertical laps should be a minimum of 150 mm, with laps in adjacent strips of product staggered.
- For vertical installation, the vertical laps should be 150 mm minimum, if the laps are sealed with an acrylic double–sided adhesive tape or vertical battens applied to the outside of the membrane, or 400 mm min., if the laps are unsealed.

General

Pipe Penetrations

- For all pipe penetrations, *Kingspan* **nilvent**® is star cut and dressed up the side of the penetrations. Use tape to seal the *Kingspan* **nilvent**® around the pipe.

Damage Repair

- Whilst *Kingspan* **nilvent**® is strong and durable in normal use, it may be damaged by careless handling.
- The risk of damage may be increased if *Kingspan* **nilvent**® is left uncovered on the roof for longer than is necessary.
- Any repairs are normally carried out with self–adhesive tape before installation of the outer leaf / roof covering.

Temporary Waterproof Covering

- It is often necessary for *Kingspan* **nilvent**® to act as a temporary, waterproof, wall or roof covering.
- *Kingspan* **nilvent**® is UV–resistant and can be safely exposed on site for a period not exceeding 2 months.

Cutting

- Cutting should be carried out using a sharp knife.

Availability

- *Kingspan* **nilvent**® is available through specialist insulation distributors and selected builders' and roofing merchants throughout the UK and Ireland.

Packaging and Storage

- The polyethylene packaging of Kingspan Insulation products, which is recyclable, should not be considered adequate for outdoor protection.
- Ideally, rolls should be stored inside a building. If, however, outdoor storage cannot be avoided, the rolls should be stored on their sides, on a clean dry surface, and protected from sunlight.

Health and Safety

- *Kingspan* **nilvent**® is chemically inert and safe to use.
- A Safety Information Data Sheet for this product is available from the Kingspan Insulation website www.kingspaninsulation.co.uk/safety or www.kingspaninsulation.ie/safety.

Please note that the white upper surface on this product is designed to enhance its performance. This surface will reflect light, including ultraviolet light. Therefore, if this membrane is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream.

Warning – do not stand on or otherwise support your weight on this product unless it is fully supported by a load–bearing surface.

Product Details

Composition

Kingspan **nilvent**® comprises a laminated, 3–layer polyolefin construction. The top layer provides protection from UV and mechanical damage. The middle layer is the functional layer. The bottom layer provides abrasion resistance. *Kingspan* **nilvent**® has a light grey upper surface, printed with the *Kingspan* **nilvent**® logo, and a dark grey lower surface.

Standards and Approvals

Kingspan **nilvent**® is manufactured to the highest standards under a management system certified to ISO 9001: 2008 (Quality management systems. Requirements) and ISO 14001: 2004 (Environmental management systems. Requirements with guidance for use).

Its use is covered by BBA Certificate 11/4870.

Standard Dimensions

Kingspan **nilvent**® is available in the following dimensions:

Nominal Dimension	Availability
Roll Length (m)	50
Roll Width (m)	1.5
Thickness (mm)	0.40
Area per Roll (m^2)	75
Weight (kg/m^2)	0.13
Weight per Roll (kg)	9.8

Water Vapour Resistance

Kingspan **nilvent**® is an LR underlay, as defined by BS 5250: 2011 + A1: 2016 (Code of practice for control of condensation in buildings). It achieves a resistance of 0.10 MN·s/g and a water vapour transmission S_d of 0.02 m when tested in accordance with BS EN 13859-1: 2014 (Flexible sheets for waterproofing. Definitions and characteristics of underlays. Underlays for discontinuous roofing).

Liquid Water Penetration Resistance

Kingspan **nilvent**® is classified as W1, when tested, unaged, in accordance with BS EN 1928: 2000 – Method A (Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for waterproofing. Determination of watertightness). W1 is the best possible classification.

Kingspan **nilvent**® is non–tenting, and can be fully or partially supported.

Air Permeability

Kingspan **nilvent**® is airtight, when tested at normal building pressures, i.e. 50 Pa pressure difference.

Tensile Strength

Kingspan **nilvent**® achieves an unaged tensile strength of 270 N / 50 mm in the longitudinal direction, and 225 N / 50 mm in the transverse direction, when tested in accordance with BS EN 12311–1: 2000 (Flexible sheets for waterproofing. Determination of tensile properties. Bitumen sheets for roof waterproofing).

Nail Tear Strength

Kingspan **nilvent**® achieves a nail tear strength of 120 N in the longitudinal direction, and 140 N in the transverse direction, when tested in accordance with BS EN 12310–1: 2000 (Flexible sheets for waterproofing. Determination of resistance to tearing (nail shanks). Bitumen sheets for roof waterproofing).

UV / Heat Ageing

Kingspan **nilvent**® maintains its W1 classification for liquid water penetration, and its tensile strength is only reduced to 220 N / 50 mm in the longitudinal direction, and 160 N / 50 mm in the transverse direction, when aged in accordance with BS EN 1297: 2004 (Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roofing. Method for artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water) and BS EN 1296: 2001 (Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roofing. Method of artificial aging by long term exposure to elevated temperature).

This means that *Kingspan* **nilvent**® maintains adequate functional performance after continuous exposure to UV–light at 50°C for 336 hours, and then continuous exposure to a temperature of 70°C for 90 days.

Kingspan **nilvent**® can be left exposed on a roof or wall for a period of up to 2 months, after which time is must be fully protected from UV–light.

Wind Noise Sensitivity

Kingspan **nilvent**® is quiet when exposed to the wind uplift forces prevalent in the UK and Ireland.

Resistance to Solvents & Fungi

Kingspan **nilvent**® resists attack by mould and fungus growth, and will not encourage insect attack.

Kingspan **nilvent**® is resistant to most organic and inorganic chemicals, including acids, alkalis and salts. Direct contact with wet solvents causes temporary expansion and a slight loss of physical properties. *Kingspan* **nilvent**® is not affected by the timber preservatives and treatments traditionally used in the UK and Ireland to protect timber from rotting, even when they are not fully dried out.

Limiting Temperatures

Kingspan **nilvent**® retains its strength and flexibility at temperatures down to –40ºC and up to +80ºC.

Contact Details

Customer Service

For quotations, order placement and details of despatches please contact the Kingspan Insulation Customer Service Department on the numbers below:

UK – Tel: +44 (0) 1544 388 601
– Fax: +44 (0) 1544 388 888
– email: customerservice@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie

Literature & Samples

Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear user friendly advice on typical design; design considerations; thermal properties; sitework and product data.

For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website, using the details below:

UK – Tel: +44 (0) 1544 387 384
– Fax: +44 (0) 1544 387 484
– email: literature@kingspaninsulation.co.uk
– www.kingspaninsulation.co.uk/literature

Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie
– www.kingspaninsulation.ie/literature

Tapered Roofing

For technical guidance, quotations, order placement and details of despatches please contact the Kingspan Insulation Tapered Roofing Department on the numbers below:

UK – Tel: +44 (0) 1544 387 383
– Fax: +44 (0) 1544 387 483
– email: tapered@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 975 4297
– Fax: +353 (0) 42 975 4296
– email: tapered@kingspaninsulation.ie

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service. Calculations can be carried out to provide U–values, condensation / dew point risk, required insulation thicknesses etc…

U–value calculations can also be carried out on the Kingspan Insulation U–value Calculator, available for free online at www.uvalue-calculator.co.uk or downloaded as an App.

The Kingspan Insulation Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

The Kingspan Insulation British Technical Service Department operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U–value and Condensation Risk Calculations.

BBA CERTIFICATE CS/1004-4 U Value Competency Scheme

Please contact the Kingspan Insulation Technical Service Department on the numbers below:

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Ireland – Tel: +353 (0) 42 975 4297
– Fax: +353 (0) 42 975 4296
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Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie

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Kingspan®

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