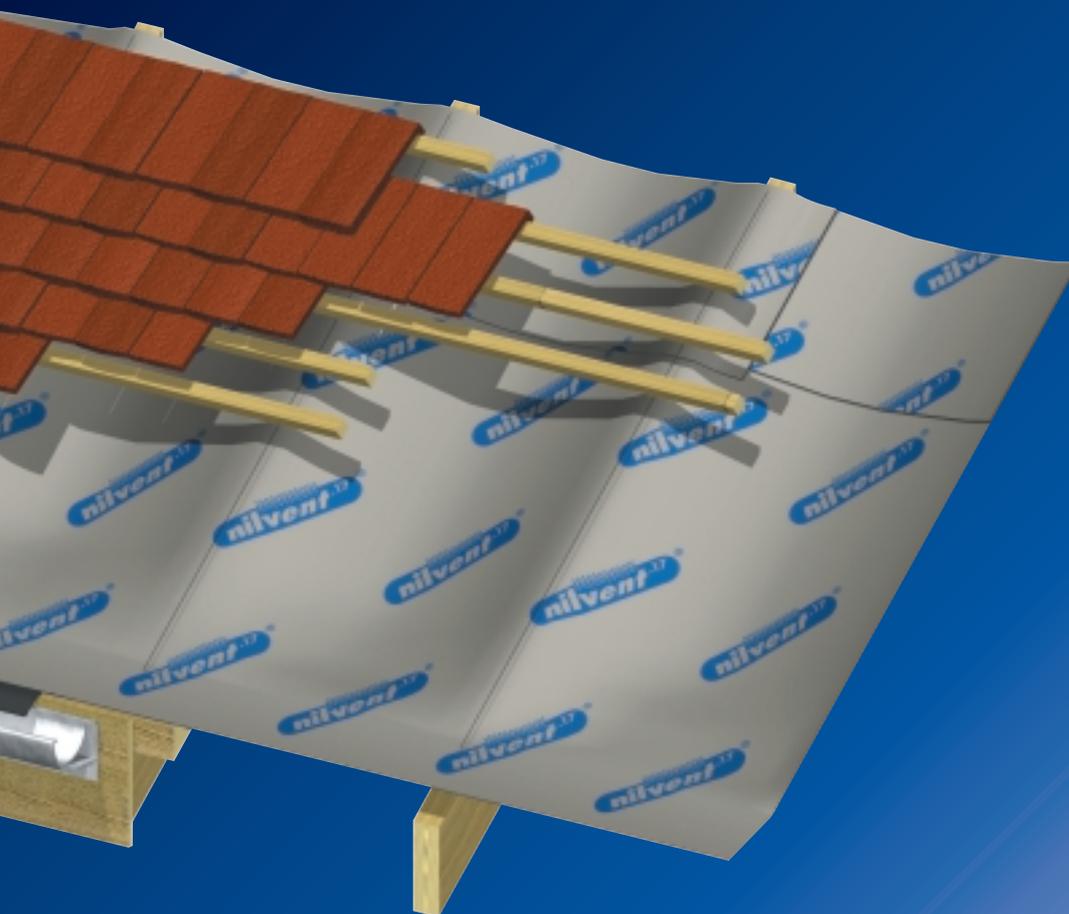




BREATHABLE MEMBRANE FOR UNVENTILATED PITCHED ROOFS



- Next generation breathable membrane technology
- Completely waterproof – can be used as a temporary waterproof roof covering
- Non-tenting
- Completely airtight
- Excellent water vapour permeability – no condensation risk
- Strong – excellent nail tear and tensile strengths
- Quiet under wind loading
- Durable – heat and UV stable
- Lifetime guarantee
- Self-sealing around nail penetrations
- Lightweight
- Easy to handle and install
- Ideal for newbuild
- Environmentally friendly – CFC/HCFC-free with zero Ozone Depletion Potential (ODP)



Typical Design Details

Horizontal Installation on a Continuous Substrate

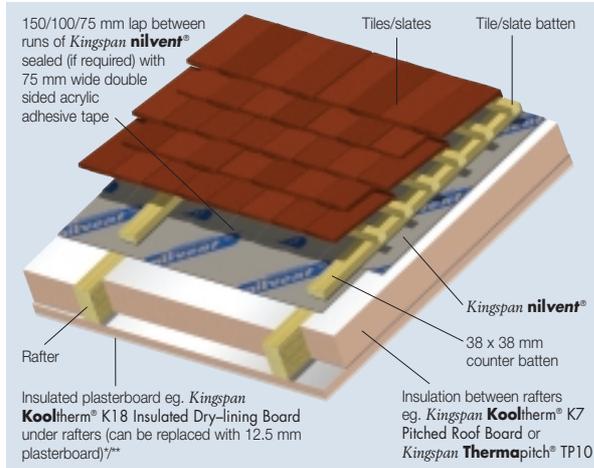


Figure 1a Fully Filled Insulation Between Rafters – No Sarking Board

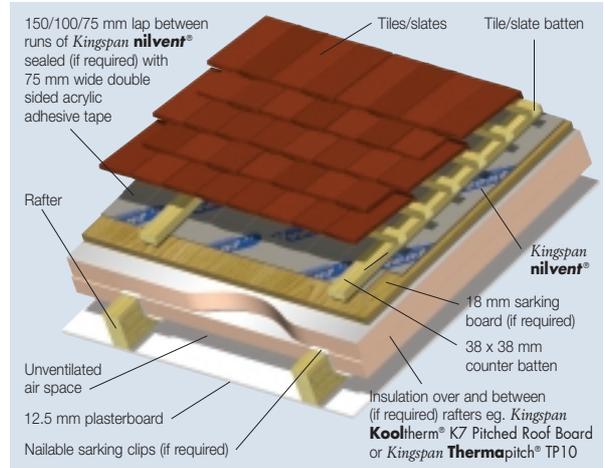


Figure 1b Insulation Over Rafters – Sarking Board/No Sarking Board

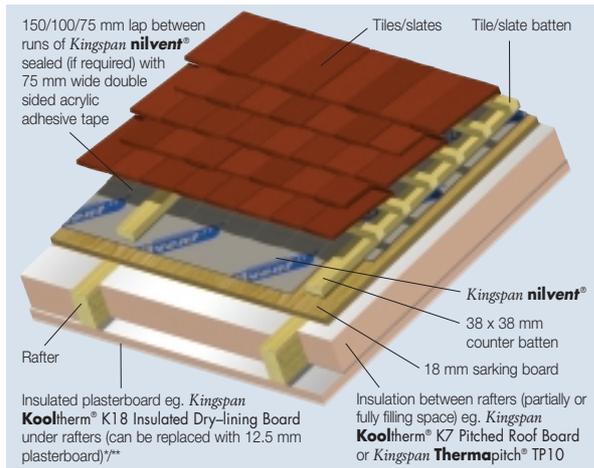


Figure 1c Insulation Between Rafters – Sarking Board

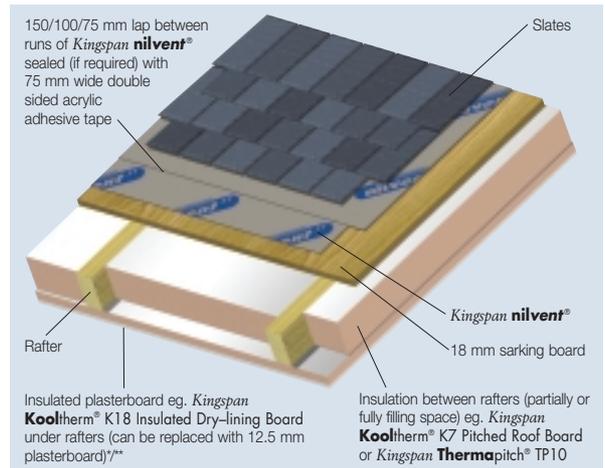


Figure 1d Insulation Between Rafters – Sarking Board & natural slates

Vertical Installation on a Discontinuous Substrate

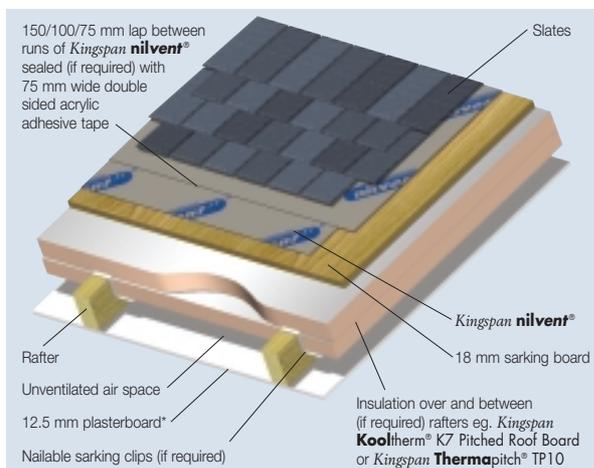


Figure 1e Insulation Over Rafters – Sarking Board and Natural Slates

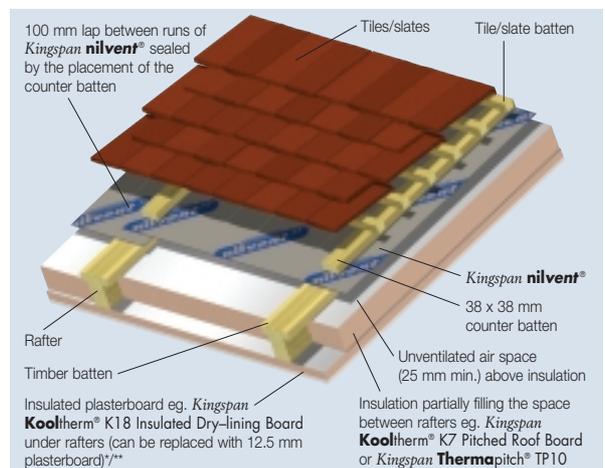


Figure 2a Partially Filled Insulation Between Rafters – No Sarking Board

Horizontal Installation on a Discontinuous Substrate

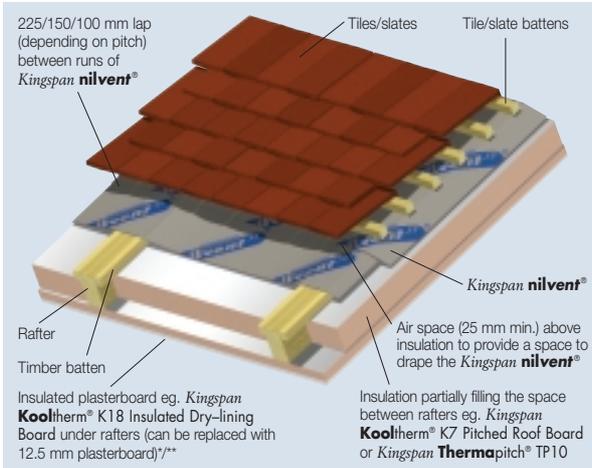


Figure 3a Partially Filled Insulation Between Rafters – No Sarking Board

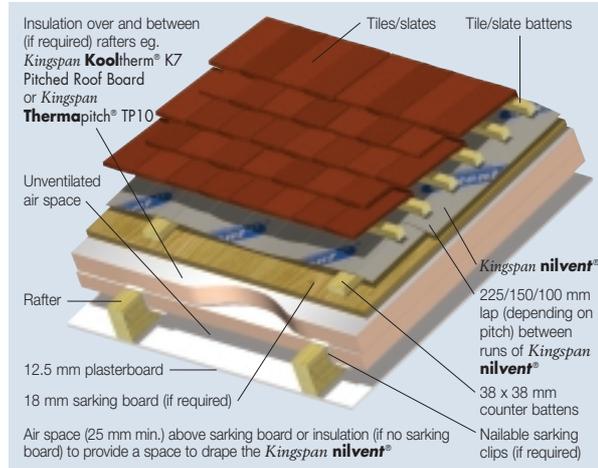


Figure 3b Insulation Over Rafters – Sarking Board/No Sarking Board

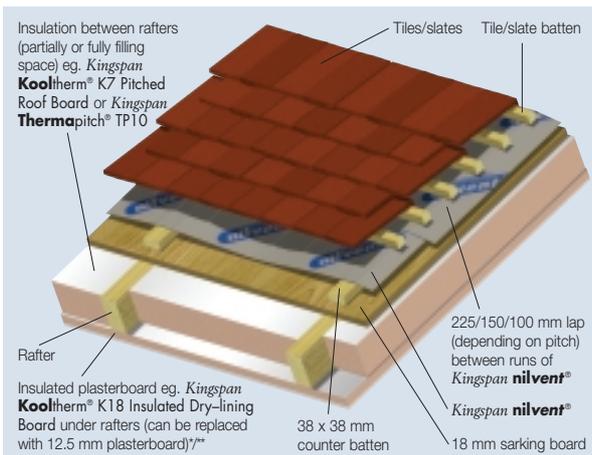


Figure 3c Insulation Between Rafters – Sarking Board

* 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 Kooltherm® K18 Insulated Dry-lining Board contains an integral vapour control layer.

Specification Clause

Kingspan nilvent® should be described in specifications as:-
The breathable membrane shall be Kingspan nilvent® comprising a laminated 3-layer polyolefin construction and shall be applied in accordance with the instructions issued by Kingspan Insulation Limited.

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)





Design Considerations

Design for 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.

Design for 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 2a). 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').

Design for Horizontal Installation on a Discontinuous Substrate

In situations where there is no continuous surface (see Figure 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: 2003 (Code of practice for slating and tiling (including shingles)) and NFRC Technical Bulletin 6.

Waterproofing

If installed as per the instructions given in this document

Kingspan nilvent[®] will give a completely watertight structure under normal weather conditions. *Kingspan nilvent*[®] is highly water resistant, and has the added advantage of self-sealing around nail penetrations. These properties mean that *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 membranes to replace sarking felt.

Breathable 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. Recent studies have shown that ventilation directly above an insulation layer can reduce its thermal efficiency.

BS 5250: 2002 (Code of practice for control of condensation in buildings) states that the vapour resistance of the breathable sarking membrane must not exceed 0.25 MN-s/g. *Kingspan nilvent*[®] has a vapour resistance of 0.17 MN-s/g. Any water vapour reaching *Kingspan nilvent*[®] escapes through it without condensing.

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, to create a suitable airspace above the breathable membrane. By keeping the tile/slate battens clear of *Kingspan nilvent*[®], counter-battens 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 the irregularity of natural slates. Artificial slates may not be suitable for direct fixing to a sarking board because the regularity of their shape does not provide for enough air movement to disperse vapour. It may be necessary to put counterbattens 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.

Recent research has proven that the 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 double sided acrylic 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, and has the added advantage of self-sealing around nail penetrations.

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 air-tightness unless the *Kingspan nilvent*[®] is to be laid in this orientation 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 air-tightness as the laps between runs are sealed by the counter-battens that are installed over them (see Figure 2a).

If the sealing of the roof is not deemed to be imperative, 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. 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. These air pressures can cause underlays to move up and down. This effect is increased if the underlay is draped rather than installed taut.

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 it moves 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 application on such contracts is identical to the standard specification, which is given here.

Fire Stops

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

Sitework

Installation in a Horizontal Orientation 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 tack in place with clout nails and cut to length with a sharp bladed 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 double sided acrylic 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 double sided acrylic adhesive tape and tacked in place with staples or 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.

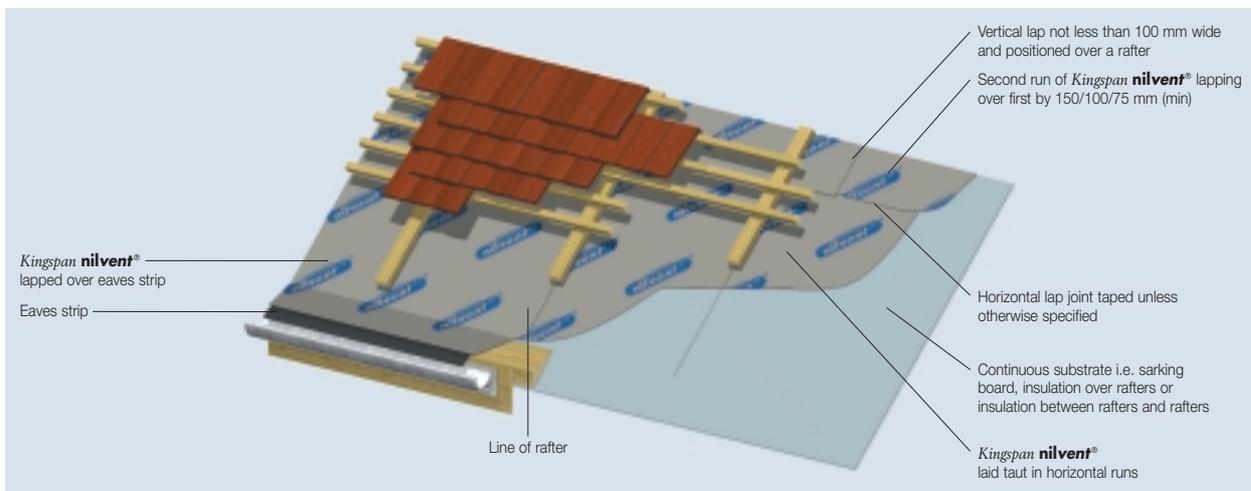


Figure 4a Eaves – Fully Supported Horizontal Installation

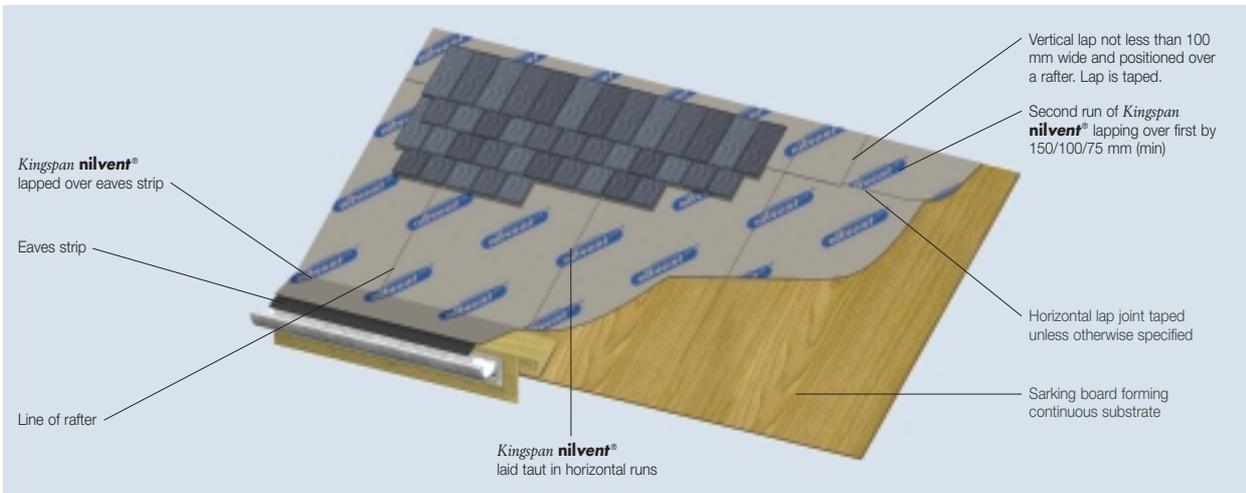


Figure 4b Eaves – Fully Supported Horizontal Installation with Natural Slates

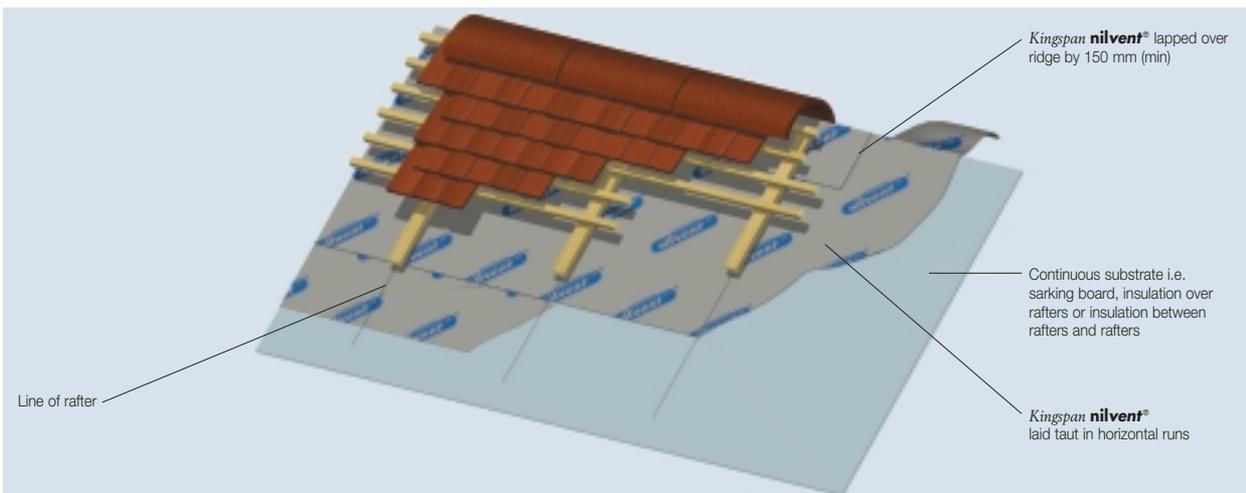


Figure 4c Ridge – Fully Supported Horizontal Installation

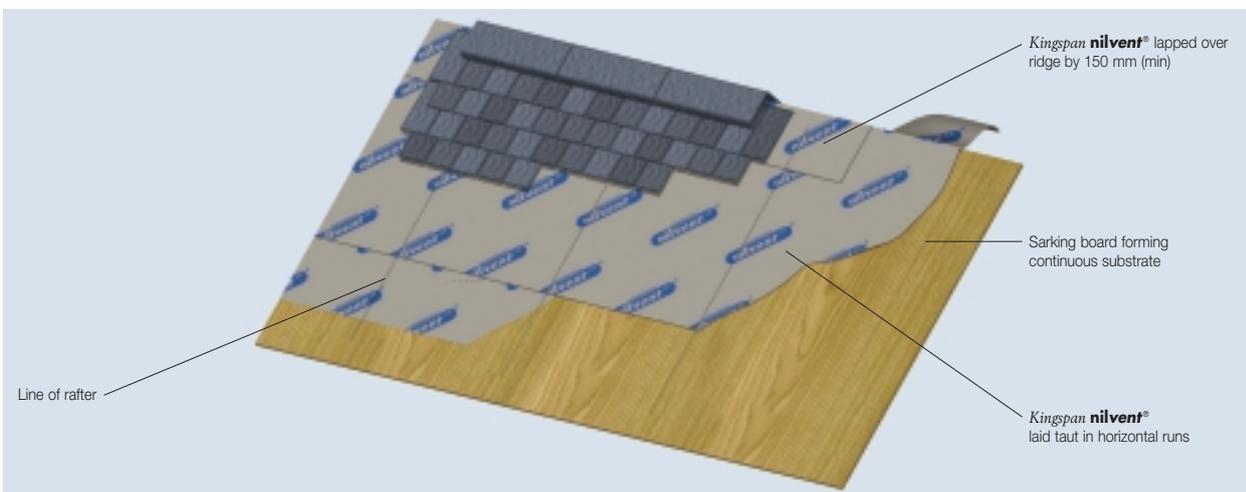


Figure 4d Ridge – Fully Supported Horizontal Installation with Natural Slates

Installation in a Vertical Orientation 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 tack in place with staples or clout nails, cut to length with a sharp bladed knife, move sideways and repeat the process.

The second run of *Kingspan nilvent*[®] should lap over the first be not less than 100 mm and be positioned so as to coincide 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 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.

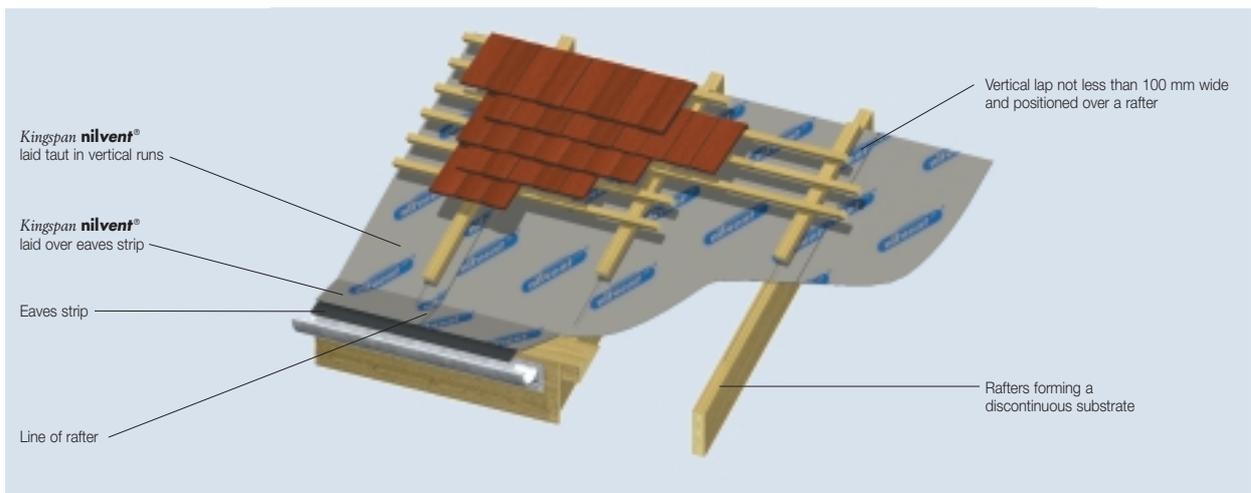


Figure 5a Eaves – Vertical Installation

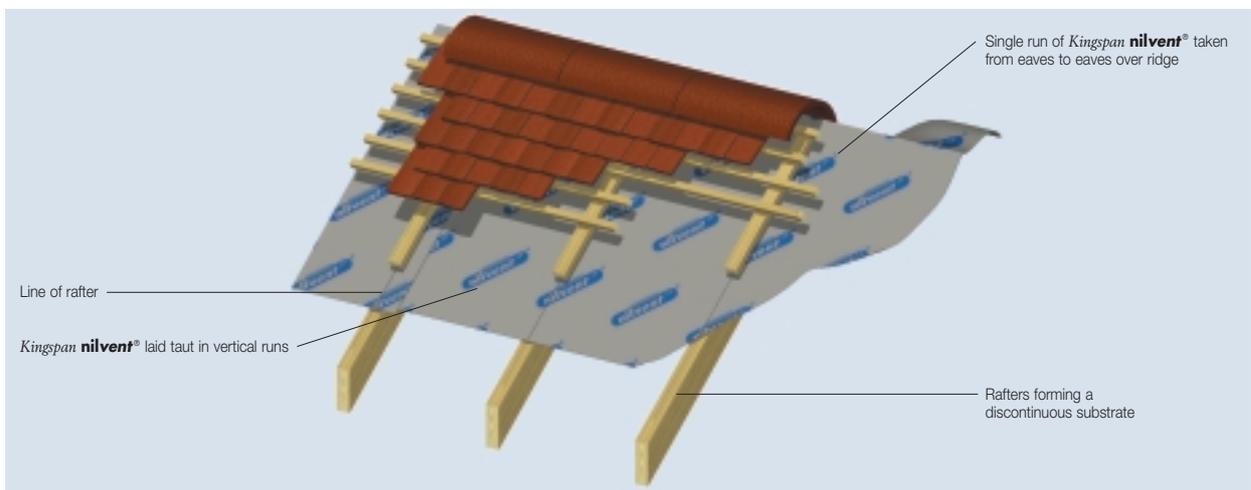


Figure 5b Ridge – Vertical Installation

Installation in a Horizontal Orientation 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 (Figure 3a) or counter battens (Figures 3b–3c) to allow water drainage. Temporarily tack in place with staples or clout nails and cut to length with a sharp bladed 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 or counter-batten position. 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 6) for horizontal installation on a continuous substrate. Effective taping of joints will prove extremely difficult.

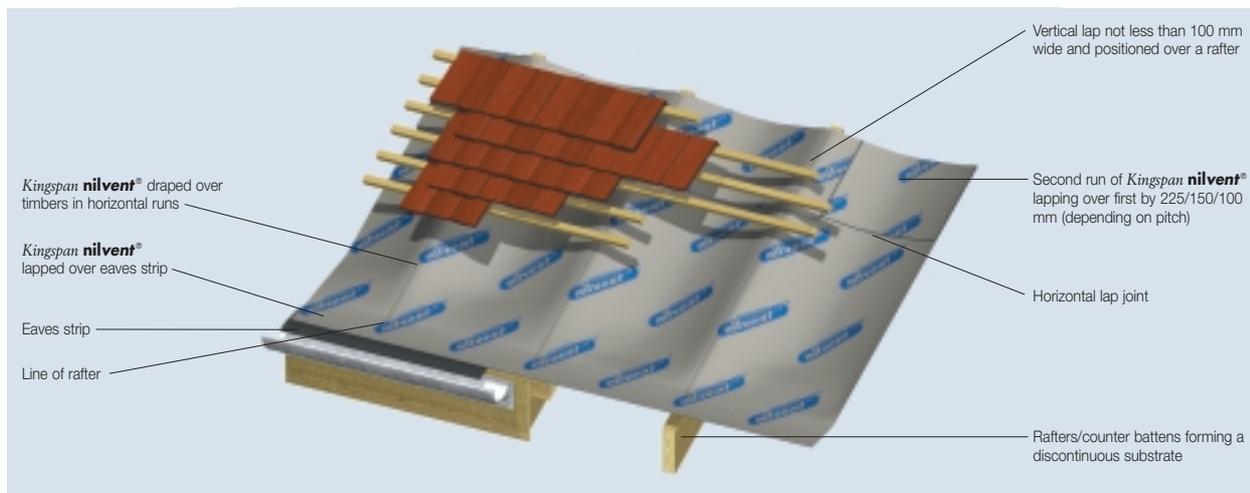


Figure 6a Eaves – Draped Horizontal Installation

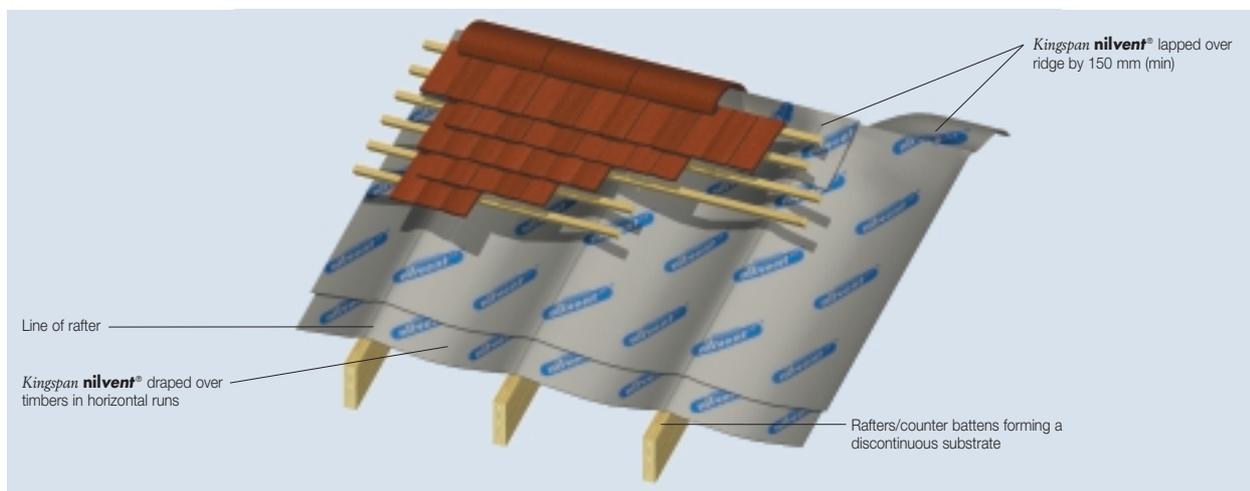


Figure 6b Ridge – Draped horizontal installation

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.

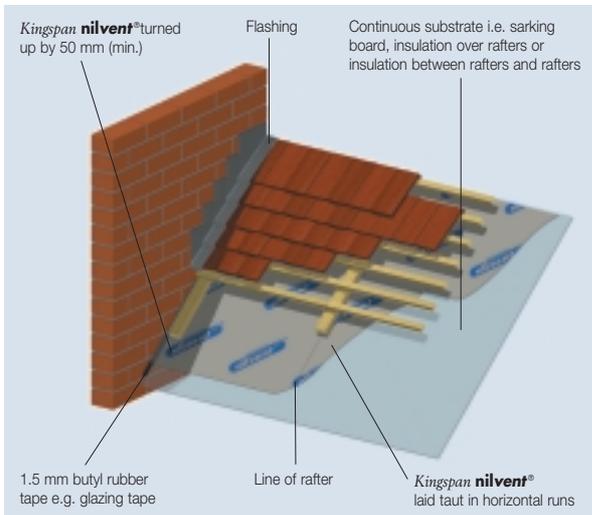


Figure 7a Abutments – Fully Supported Horizontal Installation

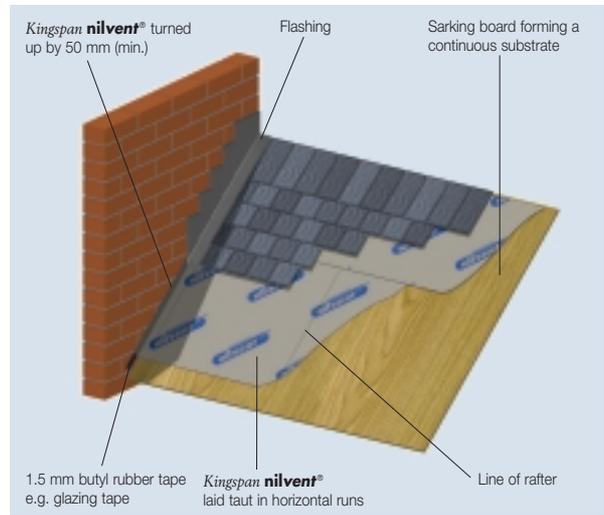


Figure 7b Abutments – Fully Supported Horizontal Installation with Natural Slates

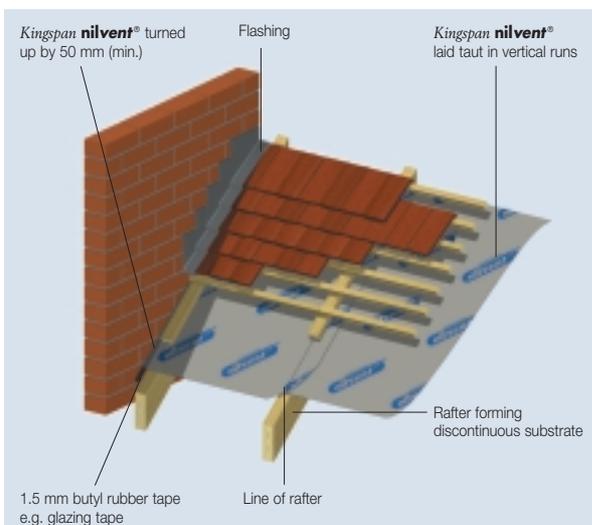


Figure 7c Abutments – Vertical Installation

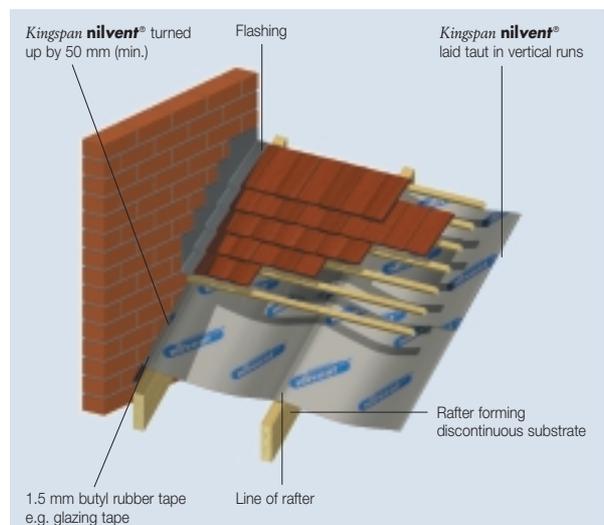


Figure 7d Abutments – Draped Horizontal Installation

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.

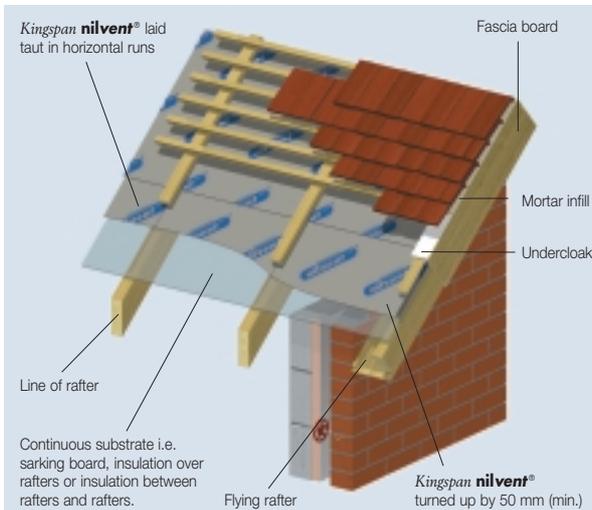


Figure 8a Verges – Fully Supported Horizontal Installation

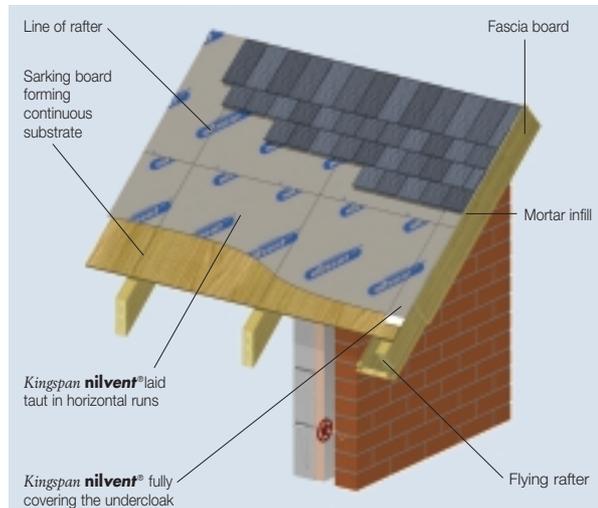


Figure 8b Verges – Fully Supported Horizontal Installation with Natural Slates

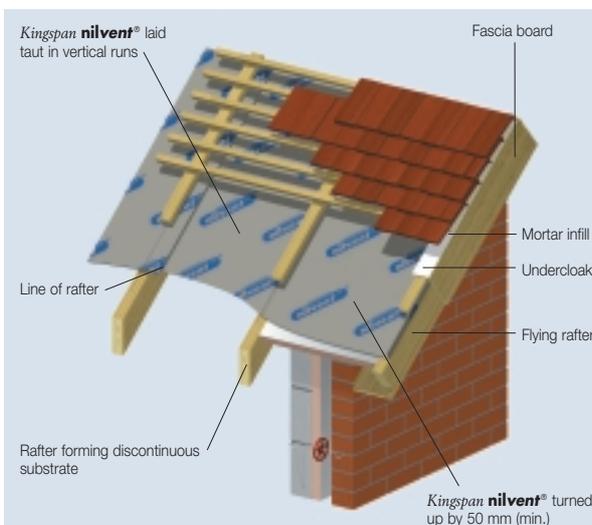


Figure 8c Verges – Vertical Installation

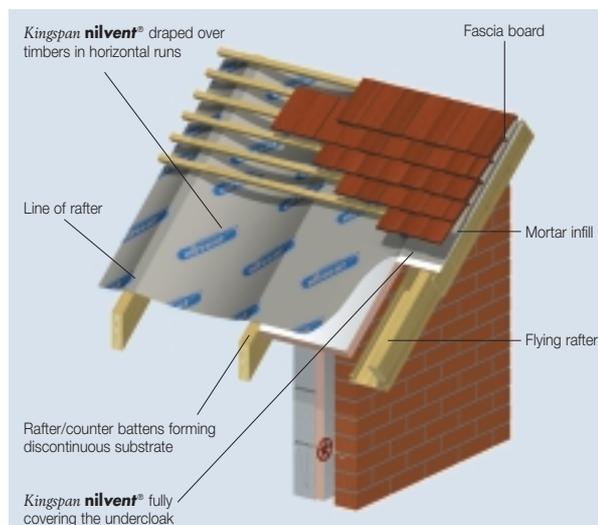


Figure 8d Verges – Draped Horizontal Installation

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 at least 150 mm overlap. 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.

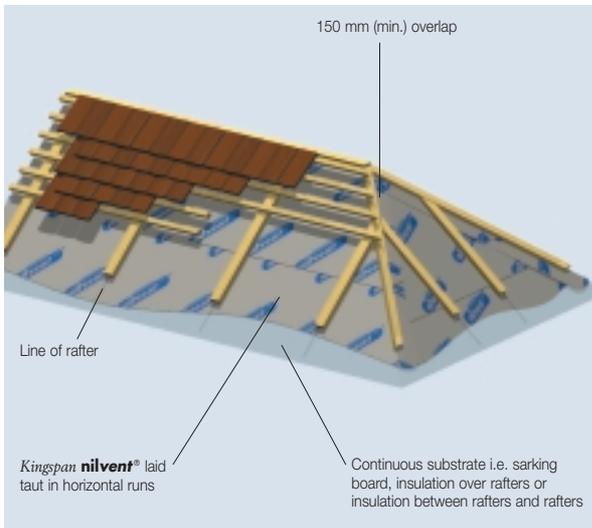


Figure 9a Hips – Fully Supported Horizontal Installation

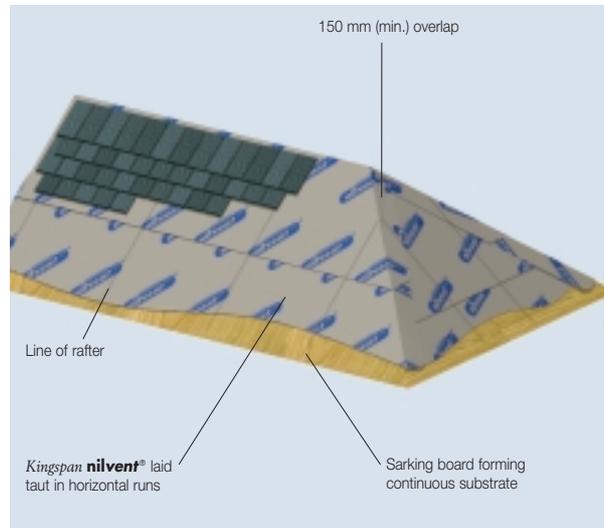


Figure 9b Hips – Fully Supported Horizontal Installation with Natural Slates

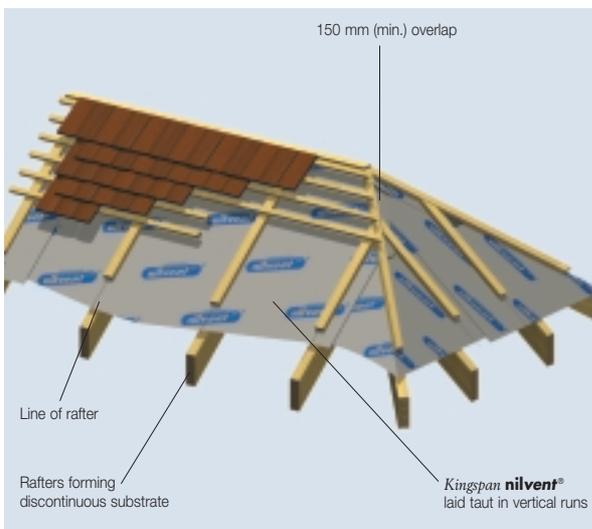


Figure 9c Hips – Vertical Installation

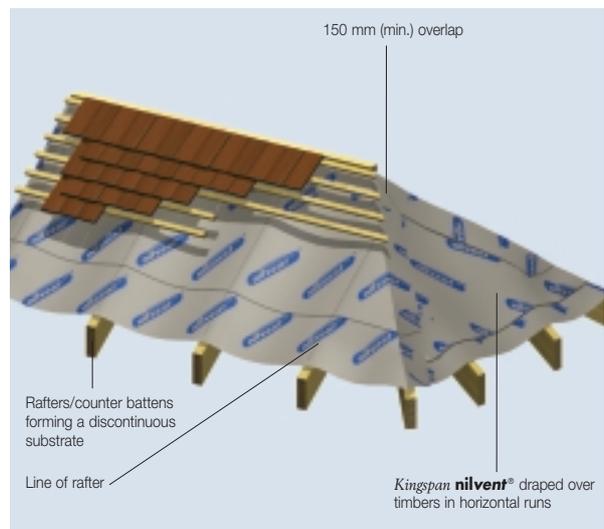


Figure 9d Hips – Draped Horizontal Installation

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.

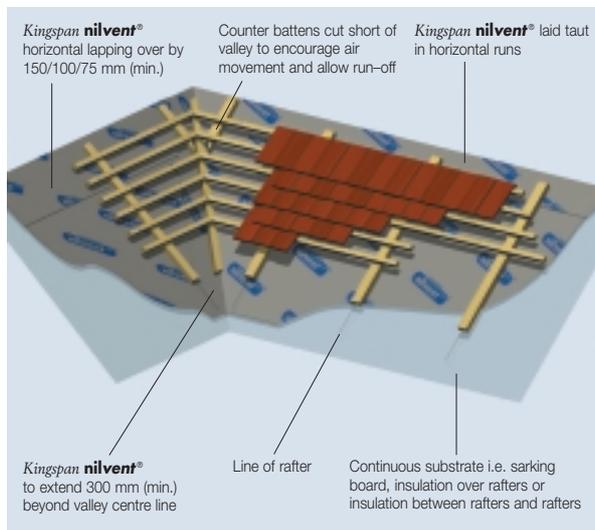


Figure 10a Valleys – Fully Supported Horizontal Installation

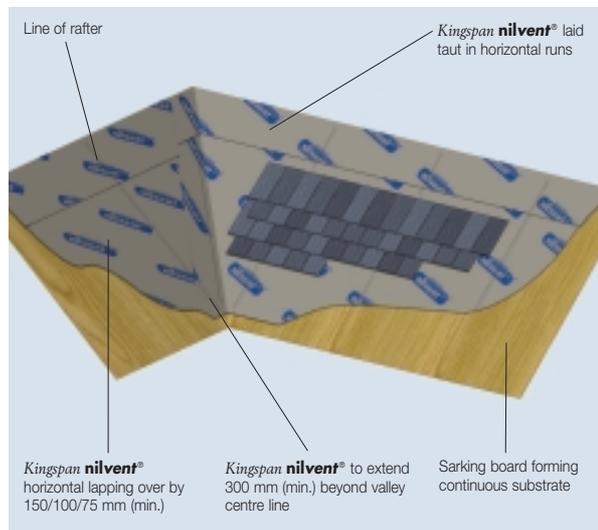


Figure 10b Valleys – Fully Supported Horizontal Installation with Natural Slates

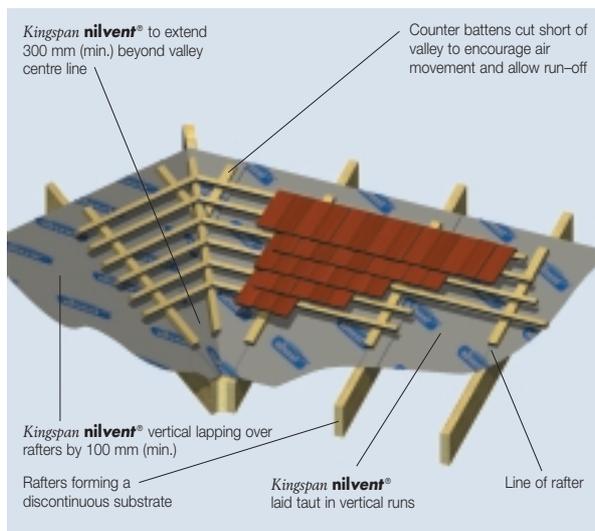


Figure 10c Valleys – Vertical Installation

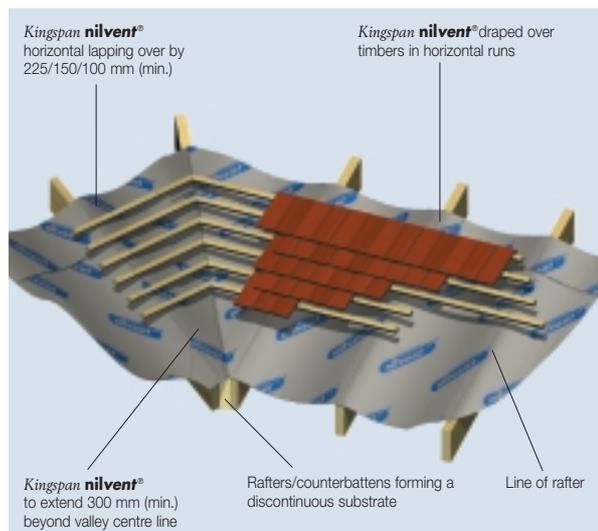


Figure 10d Valleys – Draped Horizontal Installation



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 a aluminium upstand of 50 mm. Seal the underlay to the kerb all round using 1.5 mm butyl rubber tape (e.g. glazing tape).

Pipe Penetrations

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.

Slating and Tiling

It is often necessary for the roof underlay to act as a temporary roof covering before tiles or slates are installed. **Kingspan nilvent**® is UV resistant and can be safely exposed on site for a period not exceeding 4 months.

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.

Cutting

Cutting should be carried out using a sharp bladed knife.

Availability

Kingspan nilvent® is available through specialist insulation distributors and selected merchants throughout the UK and Ireland.

Packaging

Rolls are delivered to site individually wrapped in polythene. Each roll contains a label bearing the company name, address and telephone number, and fixing instructions.

Storage

The packaging of **Kingspan nilvent**® should not be considered adequate for long term outside protection. Ideally rolls should be stored inside a building. If however, outside 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 leaflet on this topic which satisfies the requirements set out in the Control of Substances Hazardous to Health Regulations 1988 (COSHH) is available from the Kingspan Insulation Marketing Department (see rear cover).

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 membrane unless it is fully supported by a load-bearing surface.

Product Description

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 charcoal grey lower surface. **Kingspan nilvent**® is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential (ODP).



Product Data

Standards and Approvals

Kingspan nilvent® is manufactured to the highest standards under a quality control system approved to EN ISO 9001: 1994 (Quality systems. Model for quality assurance in production, installation and servicing). Its use is covered by BBA Certificate 04/4161.



EN ISO 9001 : 1994

Standard Dimensions

Kingspan nilvent® is available in the following dimensions:

Nominal Dimension	Availability
Roll Length (m)	50
Roll Width (m)	1.5
Thickness (mm)	0.50
Area per Roll (m ²)	75
Weight (kg/m ²)	0.13
Weight per Roll (kg)	11.25

Water Vapour Resistance

Kingspan nilvent® achieves a resistance of 0.17 MN-s/g when tested in accordance with BS 3177: 1959 (1995) (Method for determining the permeability to water vapour of flexible sheet materials used for packaging).

Liquid Water Penetration Resistance

Kingspan nilvent® achieves a resistance of > 2 m when tested in accordance with BS EN 20811: 1992 (1996) (Textiles. Determination of resistance to water penetration. Hydrostatic pressure test).

Kingspan nilvent® is non-tenting and can be fully or partially supported.

Air Permeability

Kingspan nilvent[®] is airtight when tested of normal building pressures in accordance with ISO 5636–3: 1992/BS 6538–2: 1992 (Method for determination of air permeance using the Bendtsen apparatus).

Tensile Strength

Kingspan nilvent[®] achieves an unaged tensile strength of 300 N/50mm in the longitudinal direction and 196 N/50mm in the transverse direction. It also achieves an aged tensile strength of 148 N/50mm in the longitudinal direction and 111 N/50mm 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 224 N in the longitudinal direction and 292 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 shank). Bitumen sheets for roof waterproofing).

Mullen Burst Strength

Kingspan nilvent[®] achieves a mullen burst strength of 570 kN/m² when tested in accordance with BS 3137: 1972 (1995) (Methods for determining the bursting strength of paper and board).

Coefficient of Dynamic Friction

Kingspan nilvent[®] achieves a coefficient of dynamic friction of 0.67 F in a longitudinal direction and 0.69 F in a transverse direction when wet. It also achieves a coefficient of dynamic friction of 0.92 F in a longitudinal direction and 0.90 F in a transverse direction when dry when tested in accordance with BBA test method TI/10.

UV/Heat Ageing

Kingspan nilvent[®] achieves class A (the highest performance) when tested in accordance with prEN 13859–1 (Flexible sheets for waterproofing – Definitions and characteristics of underlays – Part 1: Underlays for discontinuous roofing).

This result means that *Kingspan nilvent*[®] maintains adequate functional performance after continuous exposure to UV light at 50–53°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 for a period of up to 4 months.

Wind Noise Sensitivity

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

Guarantee/Durability

If installed according to the instructions given in this document, *Kingspan nilvent*[®] is guaranteed fit for purpose for the service life of the roof covering.

Disposal

Kingspan nilvent[®] can be disposed of at end of life in a conventional manner. It does not contain any toxic components.

Resistance to Solvents, Fungi & Rodents

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 timber preservatives and treatments traditionally used in the UK and Ireland to protect timber from rotting, even when they are not fully dried out.

Fire Performance

Kingspan nilvent[®] melts and shrinks away from heat but will burn in the presence of an ignition source.

The use of *Kingspan nilvent*[®] does not affect the fire rating of a roof construction. *Kingspan nilvent*[®], when subjected to fire tests, achieves the results given below. Further details of the fire performance of Kingspan Insulation products may be obtained from our Technical Services Department (see rear cover).

Test	Result
DIN 4102: 1981	B2

Limiting Temperatures

Kingspan nilvent[®] retains its strength and flexibility at temperatures down to –73°C. *Kingspan nilvent*[®] will perform satisfactorily at temperatures up to 100°C.

Contact Details

Customer Service

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

UK – Telephone: +44 (0) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: commercial.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95000
– Fax: +353 (0) 42 97 46129
– email: commercial.ie@insulation.kingspan.com

Literature & Samples

Kingspan Insulation produce 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.

Available as a complete Design Manual or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department on the numbers below:

UK – Telephone: +44 (0) 870 733 8333
– Fax: +44 (0) 1544 387 299
– email: literature.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95038
– Fax: +353 (0) 42 97 46129
– email: literature.ie@insulation.kingspan.com

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 – Telephone: +44 (0) 870 761 7770
– Fax: +44 (0) 1544 387 289
– email: tapered.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95032
– Fax: +353 (0) 42 97 95669
– email: tapered.ie@insulation.kingspan.com

Technical Advice/Design

Kingspan Insulation Ltd support all of their products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer-aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation **TECHLINE** with your project specification. Calculations can be carried out to provide U-values, condensation/dew point risk, required insulation thicknesses etc... Thereafter any number of permutations can be provided to help you achieve your desired targets.

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

Please contact the Kingspan Insulation Building Fabric Insulation Technical Services Department on the **TECHLINE** numbers below:

UK – Telephone: +44 (0) 870 850 8333
– Fax: +44 (0) 1544 387 278
– email: techline.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95032
– Fax: +353 (0) 42 97 95669
– email: techline.ie@insulation.kingspan.com

General Enquiries

For all other enquiries contact Kingspan Insulation on the numbers below:

UK – Telephone: +44 (0) 870 850 8555
– Fax: +44 (0) 870 850 8666
– email: info.uk@insulation.kingspan.com

Ireland – Telephone: +353 (0) 42 97 95000
– Fax: +353 (0) 42 97 46129
– email: info.ie@insulation.kingspan.com

Kingspan Insulation reserve the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and reference should be made to the current Kingspan Insulation price-list or advice sought from Kingspan Insulation Sales Department. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a Technical Advisory Service (see left) whose advice should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of the literature is current by contacting the Kingspan Insulation Marketing Department (see above).



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