



ROOF UNDERLAYS



THE FUNCTION OF ROOF UNDERLAYS

Roof underlays are required in virtually all tile and slate pitched roof construction and perform a number of key functions:

- Act as a secondary line of defence against wind-driven rain and snow.
- Reduce wind uplift on the roof covering.
- Are a temporary protection layer before the roof covering is applied.

Secondary line of defence

Very few tile or slate roofs are completely effective at resisting wind driven rain and snow, even when laid within their pitch and headlap limits. The underlay is designed to provide additional protection to the internal roof and building, by arresting any moisture that gets through the roof covering and safely draining it off the roof to the gutters or rainwater system.

Wind uplift

Wind that blows over a pitched roof generates positive and negative wind pressures which can, in extreme conditions, cause damage to the roof covering. The roof underlay helps to reduce the wind loading applied to the roof covering by absorbing a proportion of the wind load, especially when insulation is at horizontal joist level.

The upward deflection of the roof underlay under maximum negative pressure must be small enough to avoid contact with the underside of the roof covering. This helps reduce the wind pressure on the roof covering, thereby lowering the risk of damage.

Underlays that cannot adequately resist the imposed wind loads for given locations in the country and required batten gauges cannot be used without significant risk to the roof covering. Further information regarding wind uplift can be found on page 6.

Temporary roof covering

It is often necessary for the roof underlay to act as a temporary protection layer before the roof covering is installed.

This is especially true of re-roofing projects where the protection of insulation and building fabric is critically important. It is good practice to keep this period of underlay exposure to a minimum especially in summer months when the intensity of UV radiation is at its peak.

Glidevale Protect roofing underlays have undergone rigorous UVA age testing for 336 hours (55MJ/m²) followed by 90 days of dry heat ageing at 70° Celsius, in accordance with BS EN 13859-1 and 2. Following this testing and to meet the requirements of NHBC, BM TRADA and the Structural Timber Association, we recommend roofing underlays be covered within one month. Where longer periods of exposure occur, the underlay will need to be inspected for damage and repaired as necessary prior to covering.

For further information regarding underlay exposure time, please contact the Glidevale Protect Technical team on +44 (0)161 905 5700 or technical@glidevaleprotect.com.

No tapes required

Fully sealing the overlaps of any underlay type will affect the balance of roof space ventilation required, as unsealed laps provide a water vapour route out of the roof. In removing the fortuitous ventilation path, additional ventilation should be considered via slate/tile or ridge ventilators. BS 5250: 2011 + A1:2016 Control of Condensation in Buildings guidance explains ventilation requirements for roofs and assumes roof underlay laps are not taped so fortuitous ventilation can occur. The ability to use adhesive tapes in damp or wet conditions, along with long term adhesion and durability, are also factors to be considered.

Glidevale Protect underlays provide the robust solution required **without** the need to seal laps, with simple installation involving the underlay being draped with a shallow valley up to the maximum of 15mm deep. This allows moisture on the upper surface of the underlay to drain away safely under the tiling or slating battens to prevent ponding. All horizontal laps should be restrained by a batten as per NHBC Standards 7.2.14.

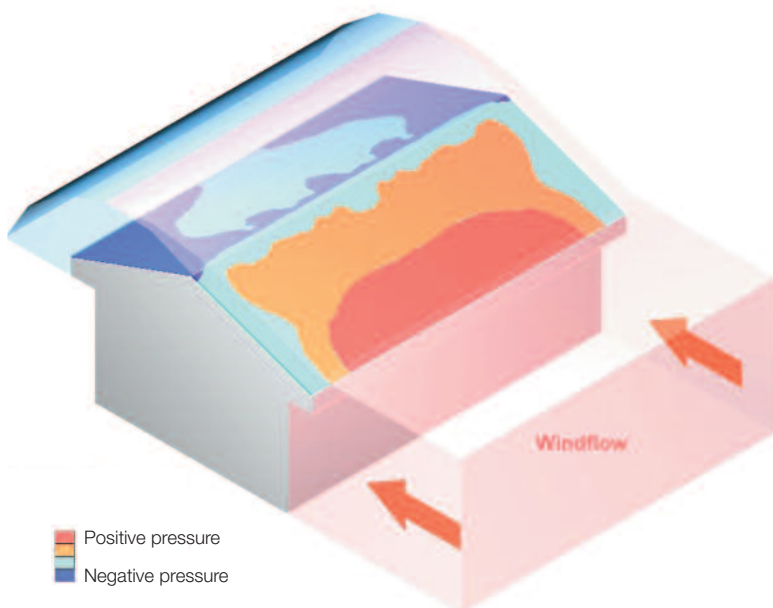


Diagram showing windflow over a roof with the positive and negative pressures created

TYPES OF ROOF UNDERLAYS

Whether new build or refurbishment, the choice of underlay for any pitched roof impacts the amount of ventilation required for the roof space to eliminate the risk of harmful condensation. It is therefore important to know the key differences in the types of roofing underlays available and their technical characteristics to assist specification and influence the ventilation strategy that is employed.

Vapour permeable underlays (Type LR)

An LR (low resistance) type underlay is both waterproof and water vapour permeable which can contribute to reducing condensation risk in roofs. For cold roofs, additional ventilation at ridge or eaves is required when using an LR underlay that is classed as airtight.

These membranes are defined as having a vapour resistance less than or equal to 0.25MNs/g.*

Air & vapour permeable underlays (Type LR)

Air and vapour open underlays are categorised as type LR products, delivering both vapour and air permeability. By providing air flow to ventilate the loft or roof space, this helps avoid the risk of harmful condensation.

The installation of this type of membrane does not require any additional roof ventilation, as accepted by the NHBC for a cold roof construction, stated in the NHBC Technical Requirements R3 document.

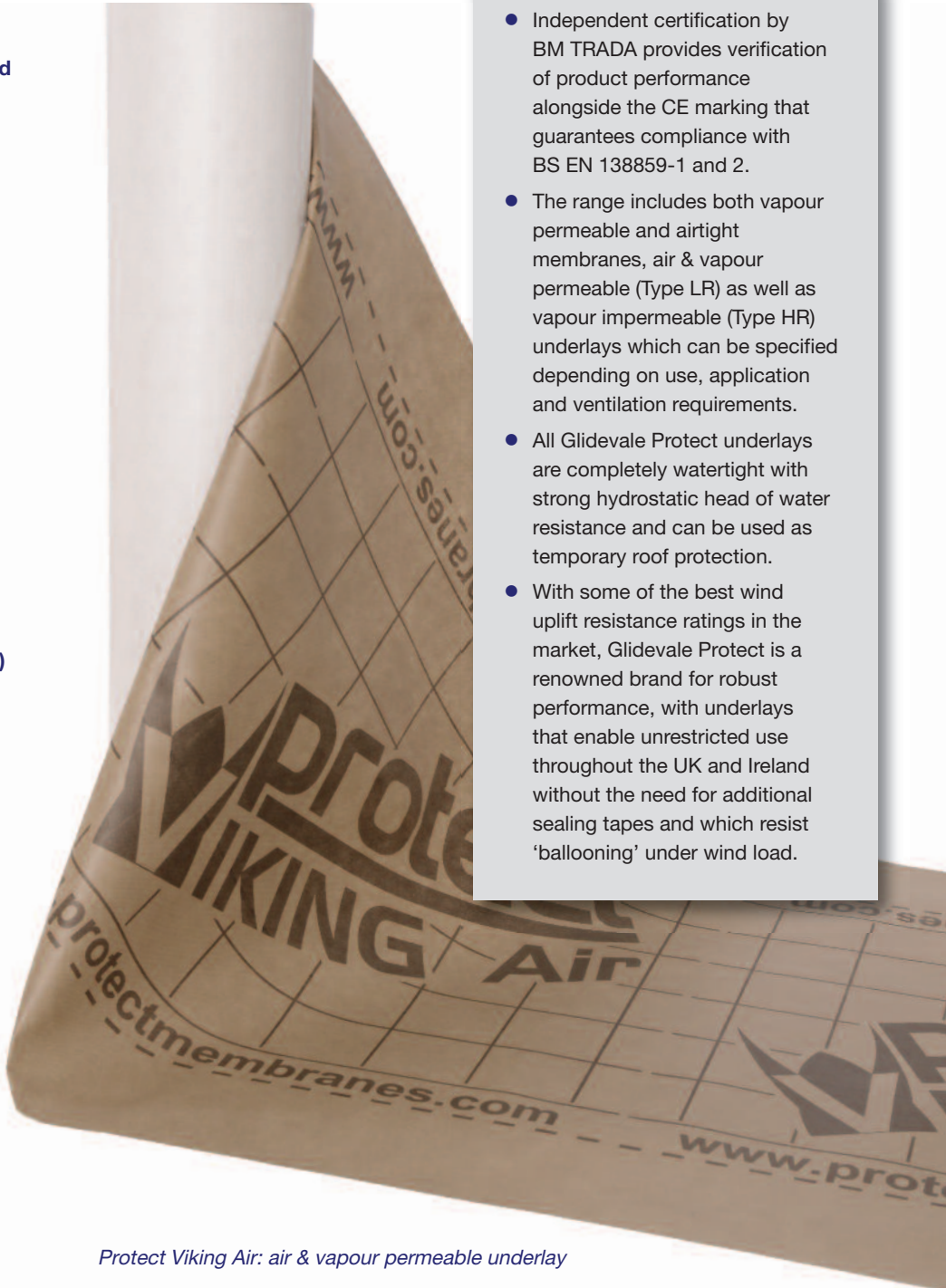
Vapour impermeable underlays (Type HR)

Designed as an alternative option to overcome the disadvantages of traditional type 1F felts, a HR (high resistance) type underlay prevents diffusion of water vapour through the material.

To avoid the risk of interstitial condensation forming on the underside of the underlay, additional ventilation will always be required with a HR underlay.

Type HR membranes are defined as having a vapour resistance greater than 0.25MNs/g.*

**These vapour resistance requirements are declared within BS 5250 – ‘Code of practice for control of condensation in buildings’.*



Protect Viking Air: air & vapour permeable underlay

The Glidevale Protect solution

- A range of roofing underlays and associated ventilation products that provide the complete solution for all types of tile and slate roofs.
- Independent certification by BM TRADA provides verification of product performance alongside the CE marking that guarantees compliance with BS EN 138859-1 and 2.
- The range includes both vapour permeable and airtight membranes, air & vapour permeable (Type LR) as well as vapour impermeable (Type HR) underlays which can be specified depending on use, application and ventilation requirements.
- All Glidevale Protect underlays are completely watertight with strong hydrostatic head of water resistance and can be used as temporary roof protection.
- With some of the best wind uplift resistance ratings in the market, Glidevale Protect is a renowned brand for robust performance, with underlays that enable unrestricted use throughout the UK and Ireland without the need for additional sealing tapes and which resist ‘ballooning’ under wind load.



Third party certification

To provide added reassurance in underlay performance, manufacturers’ products can be independently approved by notified UKAS accredited certification bodies such as BM TRADA, BBA or BRE.

Type LR benefits

- High performance in wind uplift resistance without the need for additional sealing tapes.
- Independently certified by BM TRADA
- Help to reduce the risk of harmful condensation formation in roof spaces.
- UV and heat durable.
- Unaffected by temperature changes.
- Can be used as a temporary protection prior to installation of roof covering.
- Does not generate nuisance noise.
- Embossed upper surface for reduced glare and slip resistance.
- Printed with product branding for ease of identification.

VAPOUR PERMEABLE (TYPE LR) UNDERLAYS

AIRTIGHT



VP400 PLUS^{LR}

ZYTEC

VP300

Performance	VP400 PLUS ^{LR}		ZYTEC		VP300	
	MD	CD	MD	CD	MD	CD
Weight (gsm)	170		158		125	
Resistance to water penetration	Class W1		Class W1		Class W1	
Hydrostatic head of water resistance (m)	>7.0		>2.0		>2.0	
Unaged tensile strength (N/50mm)	325	305	273	230	225	160
Aged tensile strength (N/50mm)	290	295	220	198	190	130
Nail tear strength (N)	248	294	270	216	140	198
Water vapour resistance (MNs/g)	0.08		0.15		0.17	
Equivalent air layer thickness (S _d (m))	0.016		0.030		0.034	
Wind uplift resistance at 345mm*	Zone 1-5 (1676 Pa)		Zone 1-4 (1519 Pa)		Zone 1-3 (1198 Pa)	
Wind uplift resistance at 310mm*	Zone 1-5 (>1676 Pa)		Zone 1-5 (2188 Pa)		Zone 1-4 (1508 Pa)	
Wind uplift resistance at 250mm*	Zone 1-5 (>1676 Pa)		Zone 1-5 (>2188 Pa)		Zone 1-5 (2875 Pa)	
Roll sizes (m)	1 or 1.5 x 50		1 or 1.5 x 50		1 or 1.5 x 50	

AIR PERMEABLE - VIKING AIR

Performance	MD	CD
Weight (gsm)	159	
Resistance to water penetration	Class W1	
Hydrostatic head of water resistance (m)	>1.0	
Unaged tensile strength (N/50mm)	270	230
Aged tensile strength (N/50mm)	240	200
Nail tear strength (N)	235	266
Air permeability (m ³ /m ² /hr) @ 50 Pascals	78.71	
Water vapour resistance (MNs/g)	0.04	
Equivalent air layer thickness (S _d (m))	0.008	
Wind uplift resistance at 345mm*	Zone 1-4 (1569 Pa)	
Wind uplift resistance at 310mm*	Zone 1-5 (2121 Pa)	
Wind uplift resistance at 250mm*	Zone 1-5 (>2121 Pa)	
Roll sizes (m)	1 or 1.5 x 50	

Protect Viking Air is a new, premium type LR pitched roof underlay with high air and vapour permeability, helping to avoid the risk of harmful condensation without the need for additional ventilation, as accepted by the NHBC for a cold roof construction. This next generation underlay provides class-leading, unrivalled performance in uninterrupted airflow and wind uplift resistance, ensuring wide coverage across the UK and throughout Ireland.



Type HR benefits

- Entirely water and air tight.
- High performance in wind uplift resistance without the need for additional sealing tapes.
- Independently certified by BM TRADA.
- Light and clean to handle with proven installation time saving over traditional felts.
- UV and heat durable.
- Unaffected by temperature changes.
- Can be used as a temporary protection prior to installation of roof covering.
- Does not generate nuisance noise under wind loading.
- Embossed upper surface for reduced glare and slip resistance.
- Printed with product branding for ease of identification.

VAPOUR IMPERMEABLE (TYPE HR) UNDERLAYS

AIRTIGHT



A1 T3 PLUS

A1®

Wunderlay®

Performance	A1 T3 PLUS		A1®		Wunderlay®	
	MD	CD	MD	CD	MD	CD
Weight (gsm)	190		145		120	
Resistance to water penetration	Class W1		Class W1		Class W1	
Hydrostatic head of water resistance (m)	>2.0		>2.0		>2.0	
Unaged tensile strength (N/50mm)	417	321	287	274	233	246
Aged tensile strength (N/50mm)	392	327	285	238	231	206
Nail tear strength (N)	312	377	230	234	189	199
Wind uplift resistance at 345mm*	Zone 1-5 (2094 Pa)		Zone 1-5 (1732 Pa)		Zone 1-4 (1367 Pa)	
Wind uplift resistance at 310mm*	Zone 1-5 (>2094 Pa)		Zone 1-5 (>1732 Pa)		Zone 1-5 (2145 Pa)	
Wind uplift resistance at 250mm*	Zone 1-5 (>2094 Pa)		Zone 1-5 (>1732 Pa)		Zone 1-5 (>2145 Pa)	
Roll sizes (m)	1 x 45, 1.5 x 30		1 x 45, 1.5 x 30		1 x 45, 1.5 x 30	

* More information regarding wind uplift performance can be found on page 6.



Glidevale Protect roof underlays are independently certified by BM TRADA.



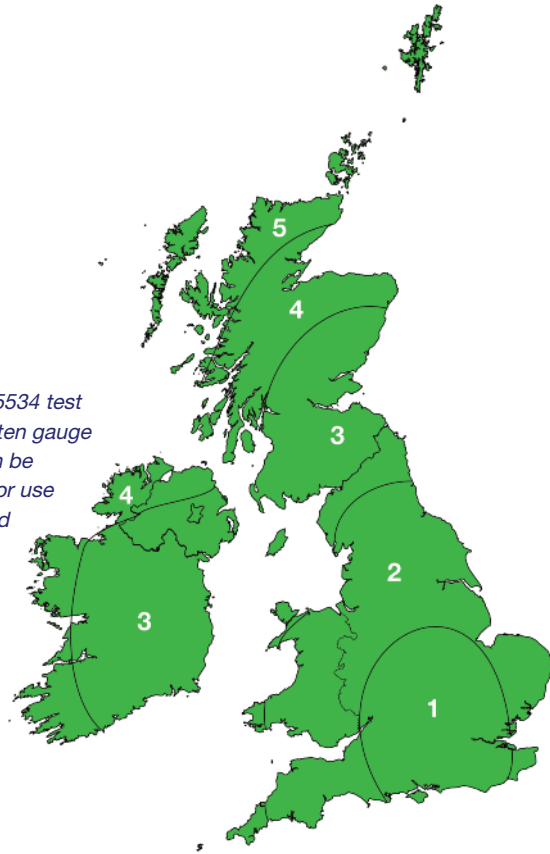
Image courtesy of DMG Services Group Ltd

WIND UPLIFT PERFORMANCE

Wind uplift

When tested to the methods set in BS 5534, Code of Practice for Slating and Tiling, many pitched roof underlays available in the UK and Ireland have restrictions on their use with regards to maximum batten gauge. This information should be contained within independent certification for the specified roofing underlay such as BM TRADA, BRE or BBA approvals. The wind uplift resistance test used in conformance to BS 5534 uses 600mm rafter centres and a range of batten gauges from 345mm for most interlocking roof tiles, 310mm for single pantile and standard pattern interlocking tiles and 250mm for the most common double lap and interlocking slates.

The results from the BS 5534 test method for the given batten gauge ensures all underlays can be categorised as suitable for use across the UK and Ireland from wind zones 1-5.



Geographical wind zone	5	4	3	2	1
Design wind pressure for underlay (Pa)	1600	1330	1150	975	820

Wind zones for Glidevale Protect underlays at different batten gauges

	Batten gauge 345mm	Batten gauge 310mm	Batten gauge 250mm
Zones 1-5	VP400 Plus ^{LR} A1T3 Plus A1	VP400 Plus ^{LR} A1T3 Plus A1 Viking Air Zytec Wunderlay	VP400 Plus ^{LR} A1T3 Plus A1 Viking Air Zytec Wunderlay VP300
Zones 1-4	Viking Air Zytec Wunderlay	VP300	
Zones 1-3	VP300		

Glidevale Protect's extensive underlay collection provides options to suit all pitched roof requirements, ensuring unrestricted use for all wind zones across the UK and Ireland.

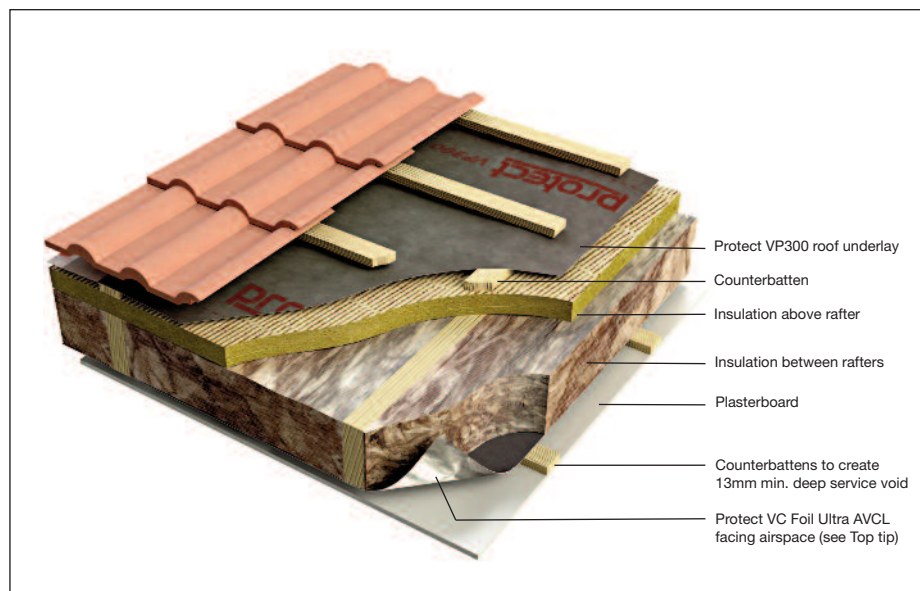
The test used in BS 5534 allows for an underlay lap, which is the most vulnerable part of the underlay system.

It is a requirement to restrain the underlay lap under one of the tile or slate battens, or where it does not fall under the regular batten gauge, to add an additional batten.

If this is not seen as desirable by the roofing contractor, the underlay lap can be increased to the next nearest batten.

Unrestrained underlay laps have been shown to cause premature failure of roofs in combination with inadequately fixed roof tiles and slates.

Glidevale Protect does not recommend the use of adhesive tapes to restrain underlay overlaps. See page 2 for more information.



CONDENSATION CONTROL IN PITCHED ROOFS

Meeting the requirements

All the regulations and supporting documents throughout the UK and Ireland cite BS 5250 as the main means of compliance. Section H.4 in the standard refers to roofs and is subdivided into cold roofs with large voids above horizontal insulation and warm roofs with small or no voids above sloping insulation. The harmful effects of condensation can be controlled by the ventilation provisions shown here when using either an LR or HR roofing underlay.

Use of sarking boards

Where sarking boards are used in the roof build up, ventilation requirements may change depending on whether closed or open jointed sarking is used.

Glidevale Protect's Technical team can advise on all ventilation requirements for any roof type or pitch. Please contact technical@glidevaleprotect.com or call +44 (0)161 905 5700.

Top tip

Using the Protect VC Foil Ultra insulating AVCL on the warm side of the insulation can significantly improve the thermal performance of the roof structure when the membrane's highly reflective surface faces into an unventilated (still) air cavity. The low emissivity airspace delivers an enhanced U-value at a fraction of the cost involved to increase the insulation thickness, in order to achieve the same level of thermal improvement.

Example of a typical new build roof

Warm pitched roof build-up with a vapour permeable underlay, insulation between and above the rafters and a well-sealed ceiling with an air and vapour control layer (AVCL) on the warm side of the insulation.

No requirement for additional ventilation.

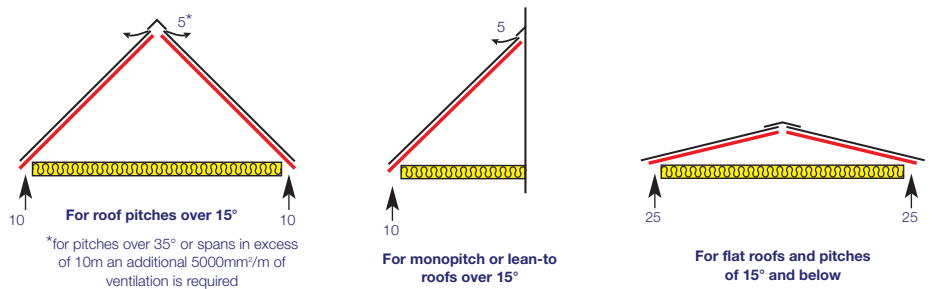
COLD ROOFS

Cold roofs can be split into those using vapour impermeable (type HR) underlays and those using vapour permeable (type LR) underlays.

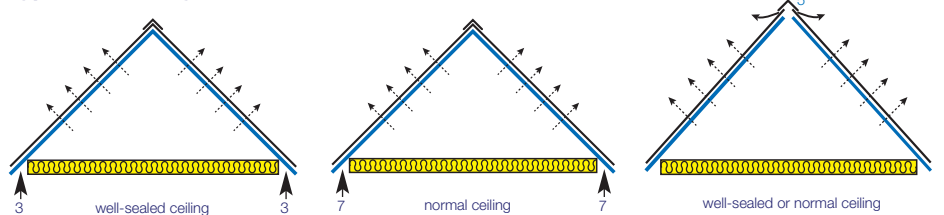
In dwelling sized roofs, BS 5250 recommends the combined use of a vapour permeable underlay and high-level ventilation to combat the risk of harmful roof space condensation in

cold pitched roofs. This is also the preferred solution of the NHBC. When an air and vapour permeable LR underlay such as Protect Viking Air is used, there is no requirement for additional ventilation, as accepted by the NHBC. The use of a HR membrane requires the provision of ventilation at both eaves and ridge.

Type HR underlays



Type LR underlays



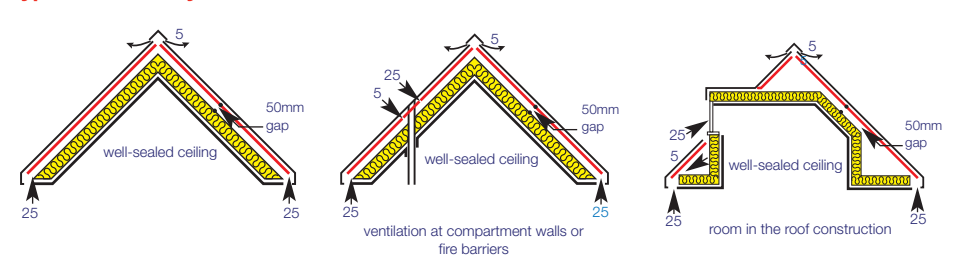
For ventilation requirements on larger than dwelling-sized roofs, please contact Glidevale Protect's Technical team.

WARM ROOFS

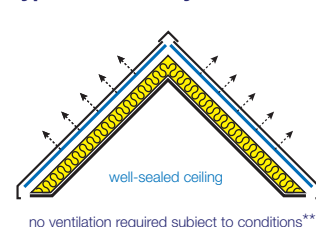
In accordance with BS 5250, it is acceptable to provide a solution of 'no additional ventilation', which will help to eliminate the formation of harmful condensation in warm pitched roof construction.

This applies to both types of LR underlays, whether vapour permeable and airtight or air and vapour open options. Where HR underlays are being used, high and low-level ventilation is required as shown below.

Type HR underlays

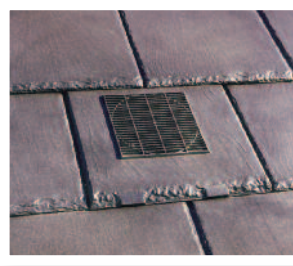


Type LR underlays



** A well-sealed ceiling/separate air and vapour control layer on the warm side of the insulation is recommended both here and for all roof types mentioned, where this is achievable.

All figures used on the diagrams above are given in 000s of mm² per metre e.g. 5 = 5000mm²/m.



A COMPREHENSIVE CHOICE OF ROOFING UNDERLAYS

Whatever your pitched roofing project, Glidevale Protect's broad collection of underlays has it covered. Providing the complete solution for all types of slate or tile roofs to meet the key requirements of water tightness, strong wind uplift resistance and condensation control, Glidevale Protect gives unrivalled choice in specification and complete peace of mind.

Vapour permeable & airtight (Type LR)

Protect VP400 Plus^{LR}
Protect Zytec
Protect VP300

Impermeable & airtight (Type HR)

Protect A1T3 Plus
Protect A1
Protect Wunderlay

Air & vapour permeable (Type LR)

Protect Viking Air

ROOFING VENTILATION RANGE

Suitable for all tile and slate roofs, the wide array of Glidevale Protect ventilation products helps reduce the condensation risk for the full cold or warm roof structure, delivering the required airflow requirements when used in conjunction with roofing underlays.

The collection includes:

G Range Slate & Tile Ventilators

In-Line® Slate, Tile & Ridge Ventilators

Universal In-Line® Slate & Tile Ventilators

Versa-Tile G5 Ventilator/Terminal

Rafter Ventilators

Fascia Ventilators

Soffit Ventilators

Abutment Ventilator

Monovent (Lean to Roof) Ventilator

Fulmetal RediRoll Ventilated

Dry Ridge/Hip system

ROOFING ACCESSORIES RANGE

A full package of roofing accessories for all tile and slate roofs is also available, designed to complement the roofing product collection and offering an ideal alternative to traditional products.

The range includes:

AluFlash lead-free alternative flashing

Universal Dry Verge Systems for slates and interlocking tiles

Universal Dry Fix Valley Trough

Universal Valley Trough

Universal Bonding Strip

OFV Eaves Skirt & Eaves Comb

Solar Inlet Terminal

CONSTRUCTION DIVISION

A whole range of product options to cover ground to roof is also available from Glidevale Protect's Construction Division. This includes a range of external wall membranes, internal airtightness and vapour control membranes for walls, floors and ceilings, sealing tapes, cavity trays, underfloor and cavity wall ventilation, intelligent passive stack ventilation - iPSV®, trickle vents, loft access hatches and radon protection.

Glidevale Protect has it covered.

For more information, visit our websites at:
glidevale.com
protectmembranes.com
Or call +44 (0)161 905 5700

For further, detailed technical advice please contact the Glidevale Protect Technical team at: technical@glidevaleprotect.com.

Stockist's stamp

GLIDEVALE PROTECT

2 Brooklands Road, Sale, Cheshire M33 3SS
T: +44 (0)161 905 5700 F: +44 (0)161 905 2085
E: info@glidevaleprotect.com
W: glidevale.com protectmembranes.com

Glidevale Protect maintains a policy of continuous development and reserves the right to amend product specifications without notice.



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