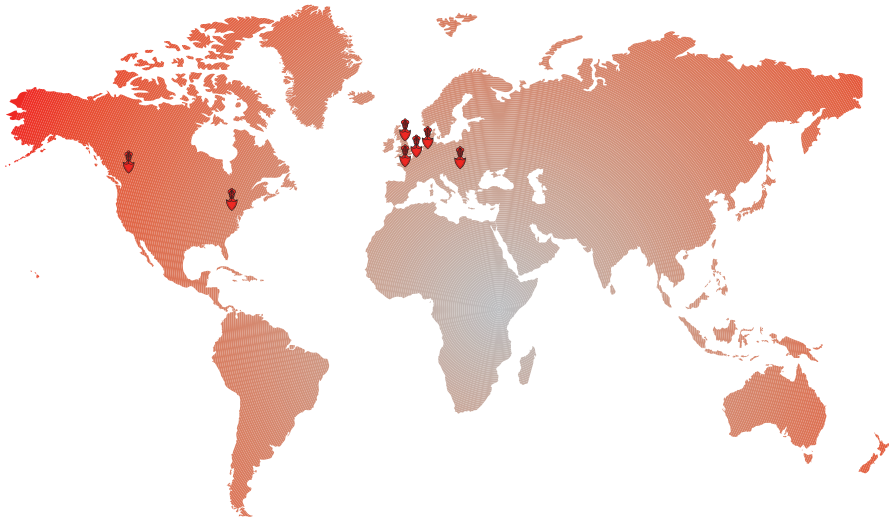
Roofers' Guide
to Underslating Membranes

IKO

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



The IKO Group

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

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

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

IKO in the UK

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

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

Contents

IKO Underslating Membrane Range

IKO produces a wide range of underslating membranes to be installed below tile and slate systems providing a secondary barrier against the elements.

A tried and tested solution, the bitumen reinforced membrane remains a popular choice for underslating in the UK.

Used within the ventilated cold roof systems as the secondary barrier to the elements.

IKO introduces the new **Rubershield Range.**

This range consists of modern breather membranes and system components suited specifically to unventilated roof constructions.

Allowing the roof to breathe, they negate the need to provide traditional ventilation to the roof space whilst maintaining that all important role of a secondary barrier to the elements.

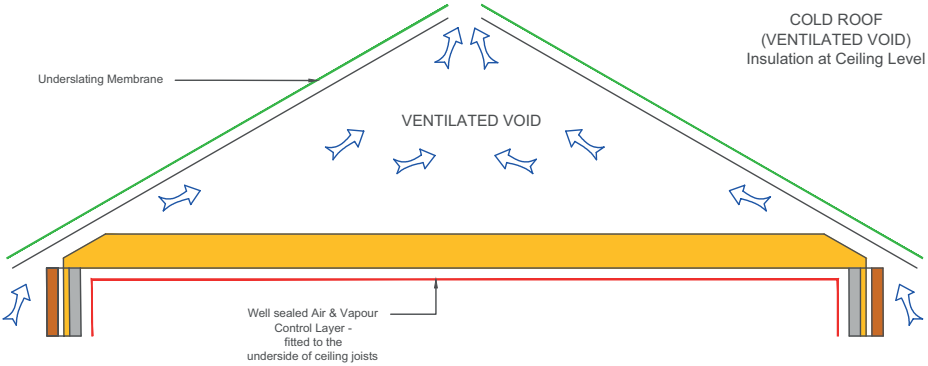
This guide will help you choose the correct underslating material and system components to complete your project.

Roofing Constructions

IKO produce a wide range of high performance membranes for a wide spectrum of construction projects.

Ventilated Cold Roof Systems

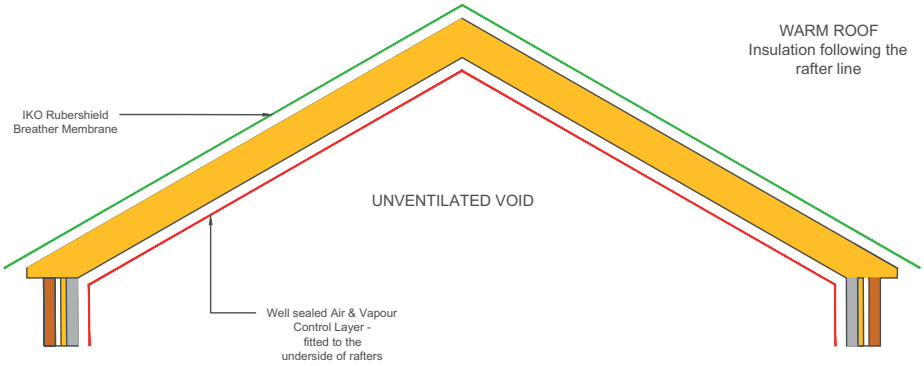
In projects proposing the use of conventional ventilation to the roof space or re-roofing projects retaining their cross-flow ventilation i.e. eaves-to-eaves; eaves-to-ridge, our IKO Rubershield breather membranes offer the addition of a vapour permeable membrane to enhance and improve upon the roof constructions ability to deal with harmful water vapour transferring from the habitable spaces below. For roofers wishing to maintain the traditional reinforced bitumen membrane material within their roofing projects, such as slating practices which nail directly to a sarking board without battens, our 1st generation reinforced bitumen underslating membrane is still available.

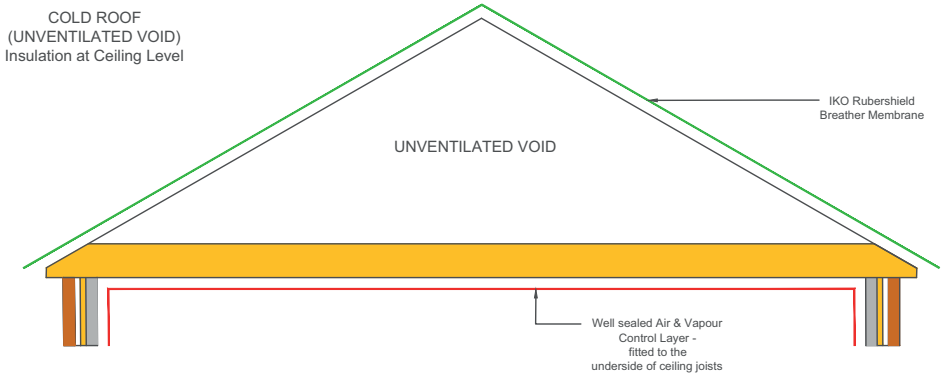


Unventilated Warm Roof and Cold Roof Systems

For new build and building extensions, greater emphasis is placed upon the buildings energy performance and modern methods of construction are increasingly leading to the requirement for building envelopes to be constructed airtight.

Modern materials and techniques are used together to minimise and restrict air leakage through the building fabric and out into the external environment, thus increasing the energy efficiency of the building fabric. The impact on roofing means that older systems which rely upon conventional cross flow ventilation are no longer suitable and our approach should be that of unventilated warm and cold roof systems incorporating the IKO Rubershield Breathable Membrane.





Why Rubershield is the breather membrane of choice

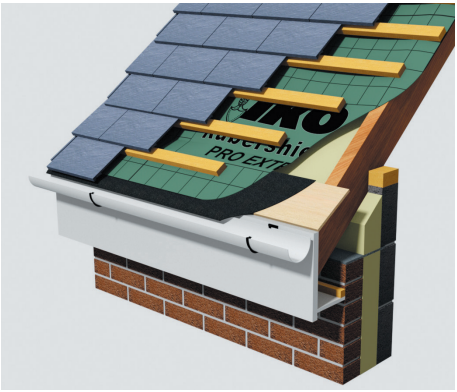
Rubershield is a second-generation breather membrane, which conforms to BS 5534: 2014 and has BBA certification to support its use within a fully supported or unsupported tiled or slated roofing systems.

The high vapour permeability and weather resistant nature of this triple-layer engineered fabric provides a permanent quality underlay, making Rubershield the professionals' ultimate choice.

Features & Benefits:

Rubershield is suitable and certified for use in all tiled and slated pitched roof construction.

- Highly breathable so allows the escape of harmful moisture vapour
- Robust
- Weather resistant
- Long-term durability
- Ideal for warm or cold roof applications (ventilated / unventilated)
- BBA Certification for all roof configurations
- Compliant with BS 5534: 2014



BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 15/5190

CE EN 13859-1; 2

Geographical Wind Zones

Applicability of IKO Rubershield according to BS5534:2014 clause A.8

The BBA Approved IKO range meets with the requirements of BS5534:2014 in providing classification of their underlays in respect of performance against published Geographical Wind Zones and Wind Uplift Test Data.

Use the table below to select the appropriate product for your project. The wind-zone classification shows which zone each option is suitable for, and the maximum batten spacings.

Underlay type	Wind Uplift Pressure (Pa)				
	Battened lap		Taped lap*		Supported application**
	345mm batten gauge	250mm batten gauge	345mm batten gauge	250mm batten gauge	
Rubershield ECO	None	Zones 1 to 3	Zones 1 to 4	Zones 1 to 5	Zones 1 to 5
Rubershield ECO EXTRA	None	Zones 1 to 4	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5
Rubershield PRO	Zone 1	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5
Rubershield PRO EXTRA	Zones 1 to 2	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5

* Laps were taped using Rubershield Jointing tape

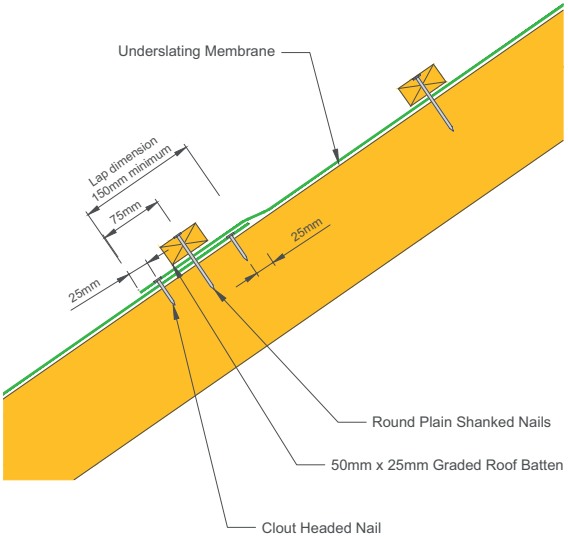
Zone suitability applies only for underlays in applications where a well-sealed ceiling is present, ridge height is not greater than 15m, roof pitch is between 12.5° and 70°, site altitude is not greater than 100m, and no significant site topography is present. Other applications might require underlays with greater wind uplift resistance and it is advisable to seek professional advice.

**As specified within BS5534:2014, membranes tested to Zone 1 at equal to or less than 250mm Batten Gauge are suitable for use in all Wind Zones at any Batten Gauge when fully supported by a nominally air tight sheet sarking board i.e. plywood, OSB, rigid insulation board.

Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Underslating Membrane
2. Clout Head Nails to BS5534:2014
3. 50mm x 25mm Graded Roof Batten
4. Round Plain Shanked Nails to BS5534:2014

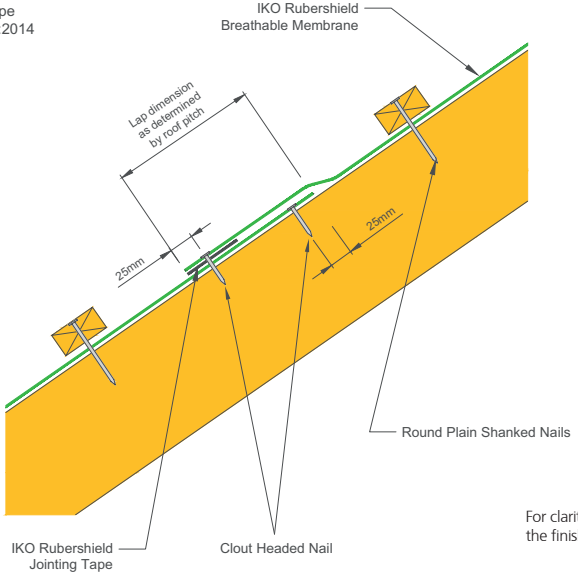
Battened Lap



Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

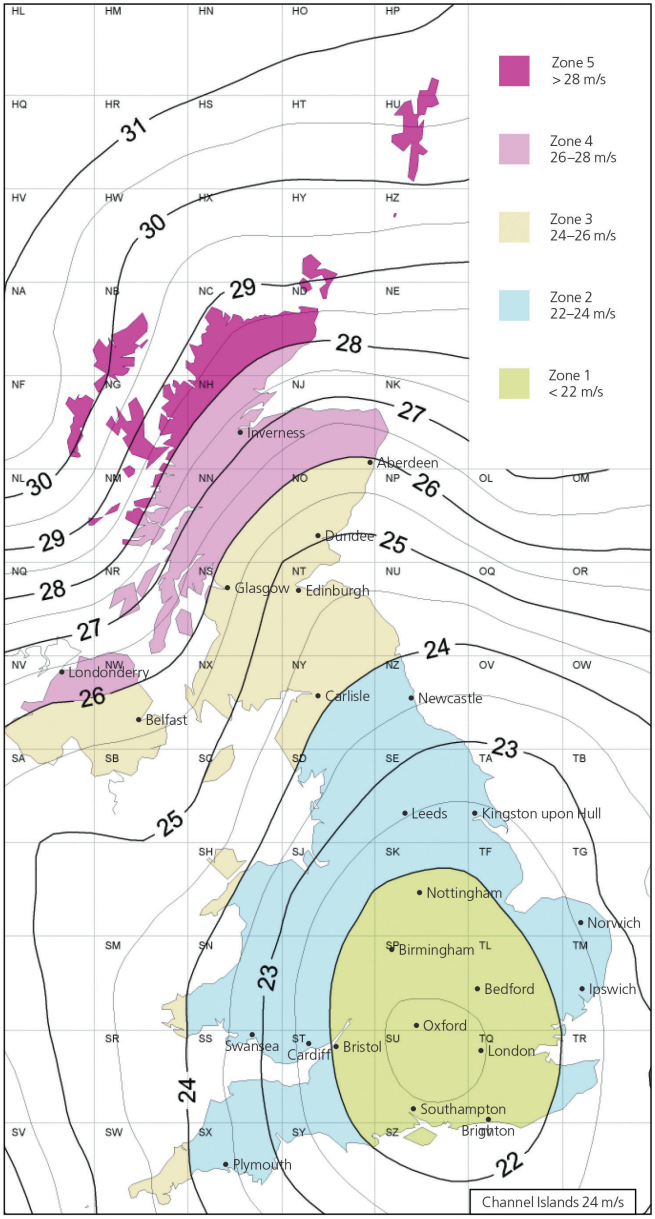
1. IKO Rubershield Breathable Membrane
2. IKO Rubershield Jointing Tape
3. Clout Head Nails to BS5534:2014

Taped Lap



For clarity images shown without the finished roof tiles/slates.

Map of basic mean wind velocity over UK

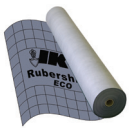


The IKO Range of Breathable Membranes for Pitched Roofs

Composition and appearance

A triple layer highly breathable weatherproof membrane, made from high tensile super-bonded polypropylene layers around a microporous polypropylene film, bonded by ultrasonic lamination.

The outer layer forms the functional weatherproof surface, the middle layer is the breathable waterproof membrane, and the inner layer protects the membrane from abrasion and damage, also giving additional strength. This enables the fabric to allow moisture vapour to pass through, whilst providing high levels of secondary protection.

Characteristics	Rubershield ECO	Rubershield ECO EXTRA	Rubershield PRO	Rubershield PRO EXTRA
				
Thickness (mm)	0.35	0.43	0.48	0.5
Mass per unit area* ($g.m^{-2}$)	100	120	140	160
Roll length* (m) [1]	50	50	50	50
Roll width* (m) [1]	1.0, 1.5	1.0, 1.5	1.0, 1.5	1.0, 1.5
Colour upper / lower	grey	light brown	black	green
Tensile strength* ($N(50\ mm)^{-1}$)				
longitudinal	180	200	240	260
transverse	90	110	150	200
Elongation* (%)				
longitudinal	60	60	60	60
transverse	60	60	60	60
Tear resistance* (N)				
longitudinal	70	80	100	100
transverse	60	70	80	90
Resistance to air penetration* ($m^3/m^2.h.50\ Pa$)	0.093	-	-	0.072
Watertightness*				
unaged	W1	W1	W1	W1
aged[2]	W1	W1	W1	W1
Water vapour transmission* (S_d)(m)	0.016	0.05	0.04	0.01
Product Code	1m = 11401000 1.5m = 11402000	1m = 11501000 1.5m = 11502000	1m = 11201000 1.5m = 11202000	1m = 11301000 1.5m = 11302000

[1] Other lengths, widths and colours are available. [2] Aged in accordance with BS EN 13859-1:2014, Annex C.

Durability

The Rubershield product range is covered by BBA certification, which identifies that under normal conditions found in a roof space, the products will have a service life comparable to a traditional roof tile underlay.

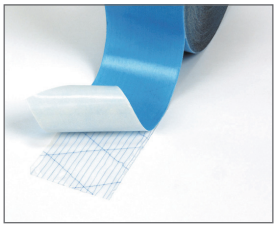
Compliance with standards

Rubershield conforms to the following requirements:

- BS 5534: 2014 (Code of Practice for slating and tiling)
- BS 5250: 2011 (Code of Practice for control of condensation in buildings)
- Fully covered for all applications by a current BBA certificate

Rubershield Jointing Tape

When using breather membranes, Rubershield Jointing Tape is helpful to allow the individual sheets of membrane to be sealed to each other and at detail work, improving waterproofing performance and the airtightness of the installation. A high performance double-sided self-adhesive tape, protected by a silicon release film on both sides, it is applied between the overlap and at perimeter details/roof penetration points in Rubershield and other polypropylene membranes to effectively seal the joints



Features & Benefits:

- High adherance properties
- Provides a reliable airtight seal
- Long lasting
- Waterproof

Dimensions	50m x 50mm
Number of rolls per box	12

The IKO Range of Non Breathable Membranes for Pitched Roofs

IKO Pitched Roof Underlay

IKO Pitched Roof Underlay is a lightweight high performance underlay for pitched tiled and slated roofs, ventilated in accordance with BS 5534: 2014.

Installed in the same manner as conventional tile and slate underlays, IKO Pitched Roof Underlay prevents the ingress of wind-driven dust, rain and snow into the roof void.

Features & Benefits:

- Clean and easy to handle
- High tensile and tear strength
- Durable
- For use in ventilated cold roofs
- UV resistant
- Convenient roll lengths
  - 45m and 15m options

Roll Size	45m x 1m	15m x 1m
Roll Weight	6.3kg	2.1kg
Number of rolls per box	140g/m^2	140g/m^2
Product Code	11620000	11621000

Test (Units)	Method	Nominal Value
Tensile Strength (N/50mm)	EN 12311-2 EN 13859-1	>230 (MD) >180 (CMD)
Elongation (%)	EN 12311-2 EN 13859-1	>35 (MD) >40 (CMD)
Resistance to Tearing (N)	EN 12310-2 EN 13859-1	>125 (MD) >145 (CMD)
Resistance to Water Penetration	EN 1928	Class W1
Water Vapour Transmission Sd (m)	EN 1931	13 (±5)

High Performance Eaves Protection Strip for Pitched Roofs

In conjunction with the underslating membrane, IKO Eaves Protection Strip should be used to give lasting protection where the underslating dresses into external gutters. It should be used with any underslating material (including breather membranes), any tile or slate finish and in cold or warm roof configurations.

The Eaves Protection Strip is a specially cut 500mm or 330mm width of high performance polyester based roofing (BS 747 Type 5U).

Features & Benefits:

- Provides eaves protection
- Conforms to NHBC technical standards
- Ensures full protection when dressing into an external half round guttering
- Suitable for use with any tile or slate

Dimensions	16 x 0.5m / 16x 0.33m
Standard	BS 8747 5U
Product Code	16 x 0.5m = 04051600 16 x 0.33m = 04051610

Installation notes

Sitework

Underslating membranes must be installed in accordance with relevant sections of BS 5534: 2014, BS 8000: Part 6: 2013 and IKO fixing instructions. Underslating materials are designed as a secondary barrier to wind driven rain and snow; it should not be considered a primary waterproofing layer. Good roofing practice dictates that the primary waterproofing finish (e.g. tiles, slates) be applied as soon as practically possible. Whilst providing a degree of protection, underslating membranes should not be considered as a totally weatherproof protection for occupied buildings or where internal fitting out is taking place.

With new buildings or buildings that have undergone extensive renovation involving wet trades, the additional water vapour within the building during this first heating season, may cause condensation to form in the roof space, which cannot be fully dispersed by the breather membrane used within the roof construction. However, when the internal conditions stabilise, this temporary occurrence of condensation will not recur in a properly designed and constructed system. (Additional information available in BS5250. Section 14.1 Owners Manual and NHBC guidance notes).

Supporting structure

An underslating membrane when installed as a fully supported system is laid over the support and secured with counter-battens.

Alternatively, where practical, the membrane can be installed over counter-battens and fixed in accordance with BS5534:2014, ensuring a nominal 10mm drape is maintained in between counter batten positions. Subsequent horizontal battens would be fitted over the draped membrane to receive the primary roof covering.

Abutments

Abutment flashings should be wedged into a mortar joint 25mm deep and at least 150mm above the level of the slates or tiles. Underslating membranes should be turned up behind the flashing at least 100mm, and sealed where appropriate with Rubershield Jointing Tape to prevent rain and snow being blown into the roof-space, and to restrict unwanted air movement.

Lap sizes table - horizontal and vertical laps

Roof pitch	Min. horizontal lap partially supported (mm)	Min. horizontal lap fully supported (mm)	Min. vertical lap (mm)
12.5° - 14°	225	150	100
15° - 34°	150	100	100
35° and greater	100	75	100

Notes to lap sizes table

- Reinforcing strips of 600mm minimum should be fixed at hips, ridges and valleys.
- It is recommended that where underslating is to be dressed into a half round external gutter, Eaves Protection Strip should be utilised in this area.
- With all breather membranes of this type, contact with solvents or wet timber preservatives can cause localised water penetration to occur prior to the main weatherproofing being installed.

Typical Cold Roof Construction

General guidance for COLD VENTILATED roofs

- Where a roof underlay or breather membrane is to be laid over open rafters, a drape of 10mm between the rafters is desirable to guide any rainwater penetrating the main roof finish away from the rafters to the drainage point.
- Provide for ventilation of the void space in accordance with BS 5534 (BS 5250: 2011), with the inclusion of a proprietary eaves and ridge (high level) vents, fixed in accordance with manufacturer's instructions.

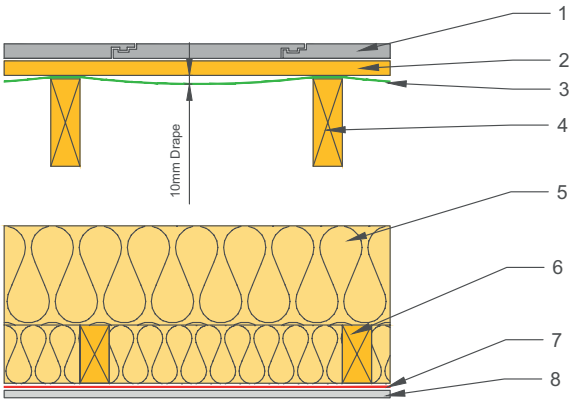
General guidance for COLD UNVENTILATED roofs

- Where a breather membrane is to be laid over open rafters, a drape of 10mm between the rafters is desirable to guide any rainwater penetrating the main roof finish away from the rafters to the drainage point. (The membrane must not be pulled tight against the underside of the tiling battens.)
- Using Rubershield in this type of cold roof requires no ventilation of any void space below the membrane. Also, when using clay or concrete tiles or natural slates, air movement is usually sufficient in the void space above the membrane to negate the requirement for additional eaves and ridge ventilation. However, when using man-made slates (or some close fitting interlocking tile systems) additional ventilation above the membrane in accordance with BS 5534: 2014 (BS 5250: 2011) is recommended to avoid potential damage to battens and fixings caused by condensation. It is recommended that guidance be sought from the tile or slate manufacturers concerned.
- To minimise the risk of condensation in cold unventilated roofs, all penetrations into the roof space must be properly sealed to maintain the integrity of the vapour control layer or external seal, and loft hatches should be made convection tight. All water tanks in the loft space must be covered and pipework lagged. The occupied building below must be ventilated in accordance with Building Regulations, and rooms that experience high humidity levels must have provision for separate air extraction.

Typical Cold Roof Design Details

Some typical cold roof detailing examples are given in this section. Drawings should be used in conjunction with Building Regulations and British Standards. Further advice regarding the detailing of Rubershield and underslating membranes in general is available from IKO's Technical Services Department.

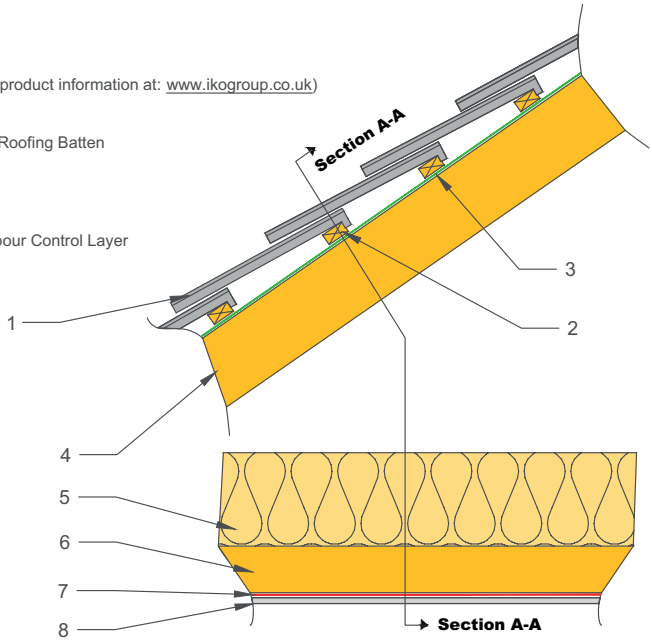
For cold roofs with ventilated voids, all of the IKO underslating membranes can be used.



Section A-A

Key to Materials
(Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Primary Roof Covering
2. 50mm x 25mm Graded Roofing Batten
3. Underslating Membrane
4. Timber Rafter
5. Mineral Wool Insulation
6. Timber Ceiling Joist
7. Well Sealed Air and Vapour Control Layer
8. 12.5mm Plasterboard

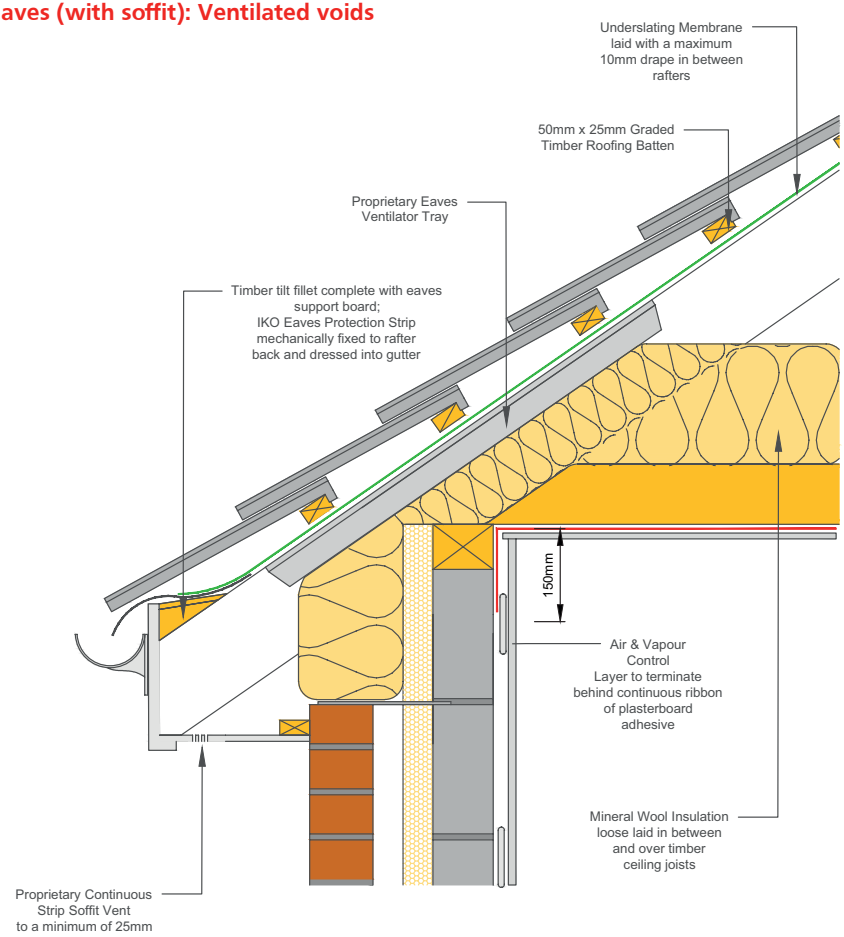


Typical Cold Roof Design Details

Some typical cold roof detailing examples are given in this section. Drawings should be used in conjunction with Building Regulations and British Standards. Further advice regarding the detailing of Rubershield and underslating membranes in general is available from IKO's Technical Services Department.

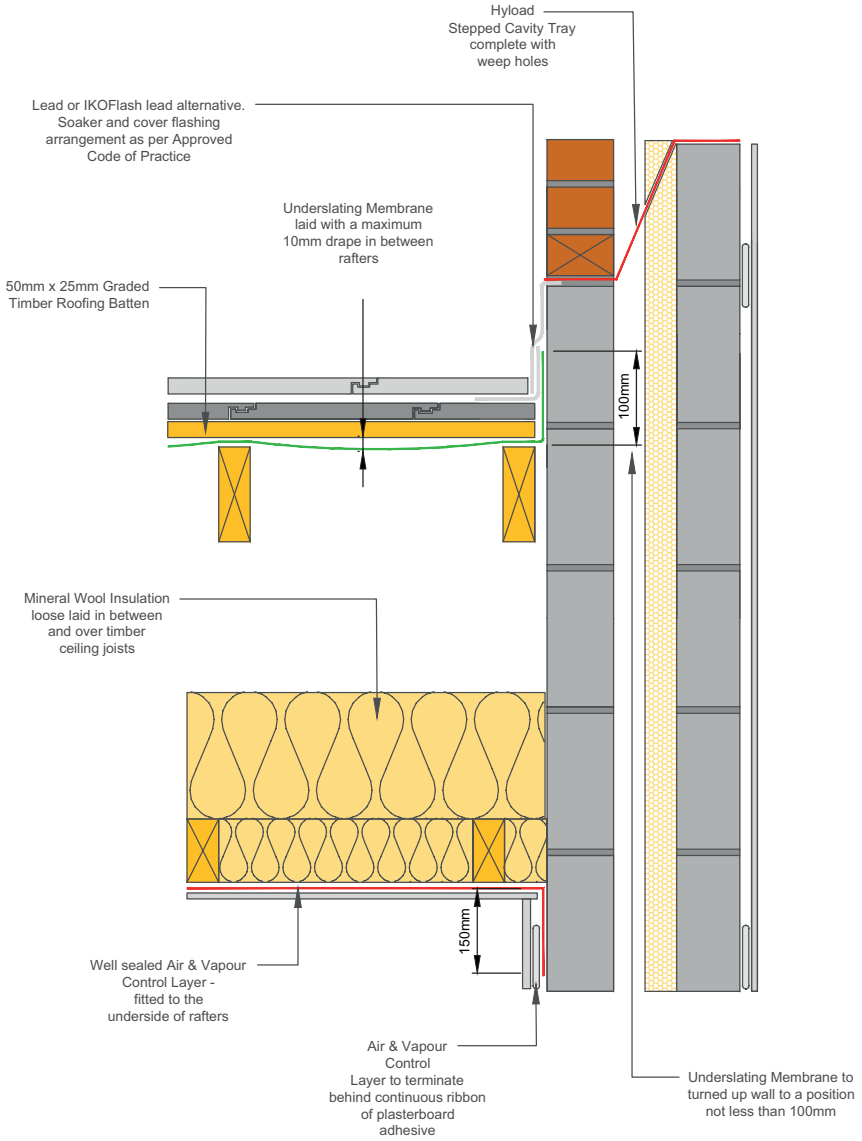
For cold roofs with ventilated voids, all of the IKO underslating membranes can be used.

Eaves (with soffit): Ventilated voids



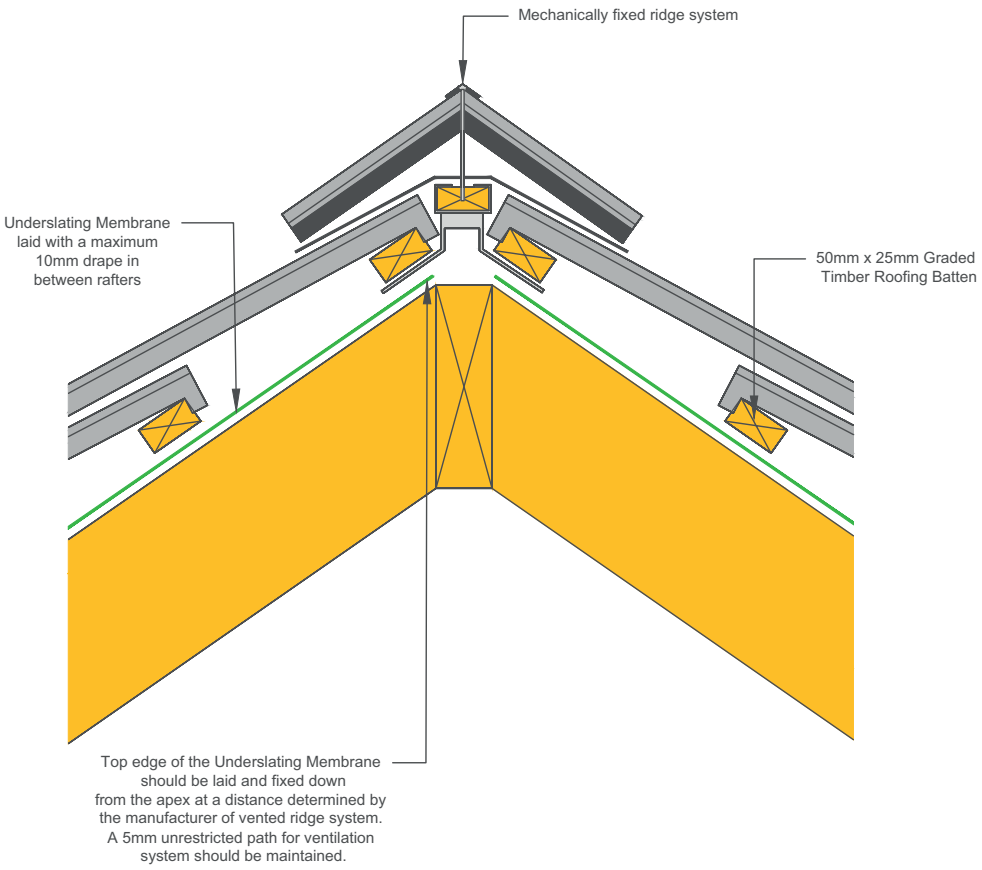
- Allow for eaves ventilation in accordance with BS 5250: 2011.

Abutments: Ventilated voids



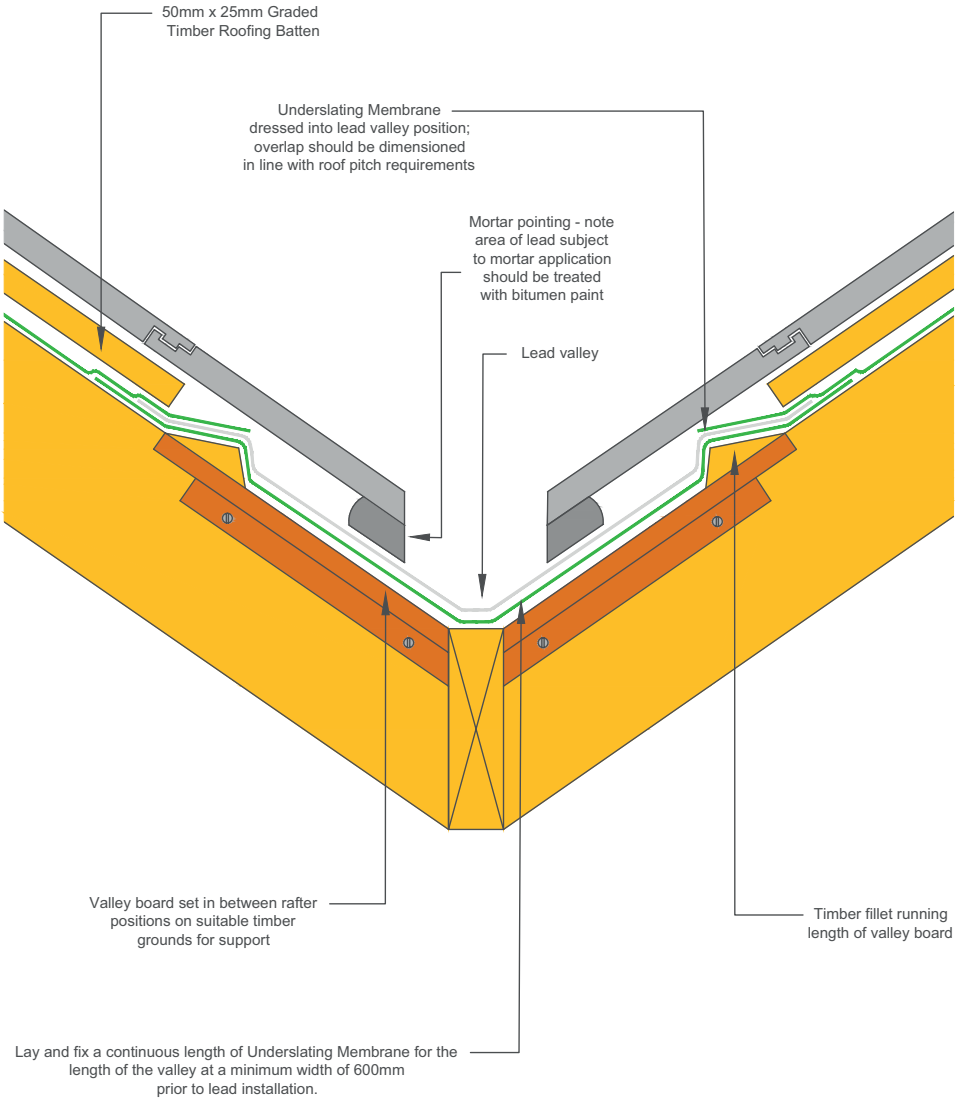
- Turn Underslating up against abutment wall by not less than 100mm, and seal to wall with Rubershield Jointing Tape.
- Fix lead flashing Code 4 or 5, in accordance with current Codes of Practice.

Ridges: Ventilated voids

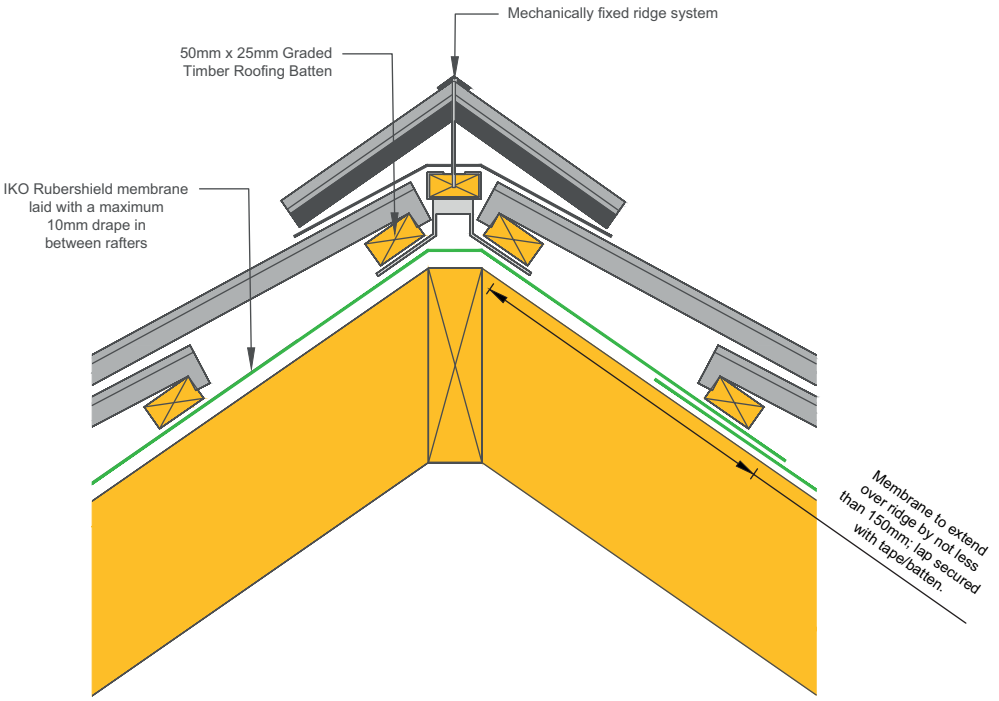


- Allow for high level ventilation in accordance with BS 5250: 2011.

Valleys (with lead lining): Ventilated voids

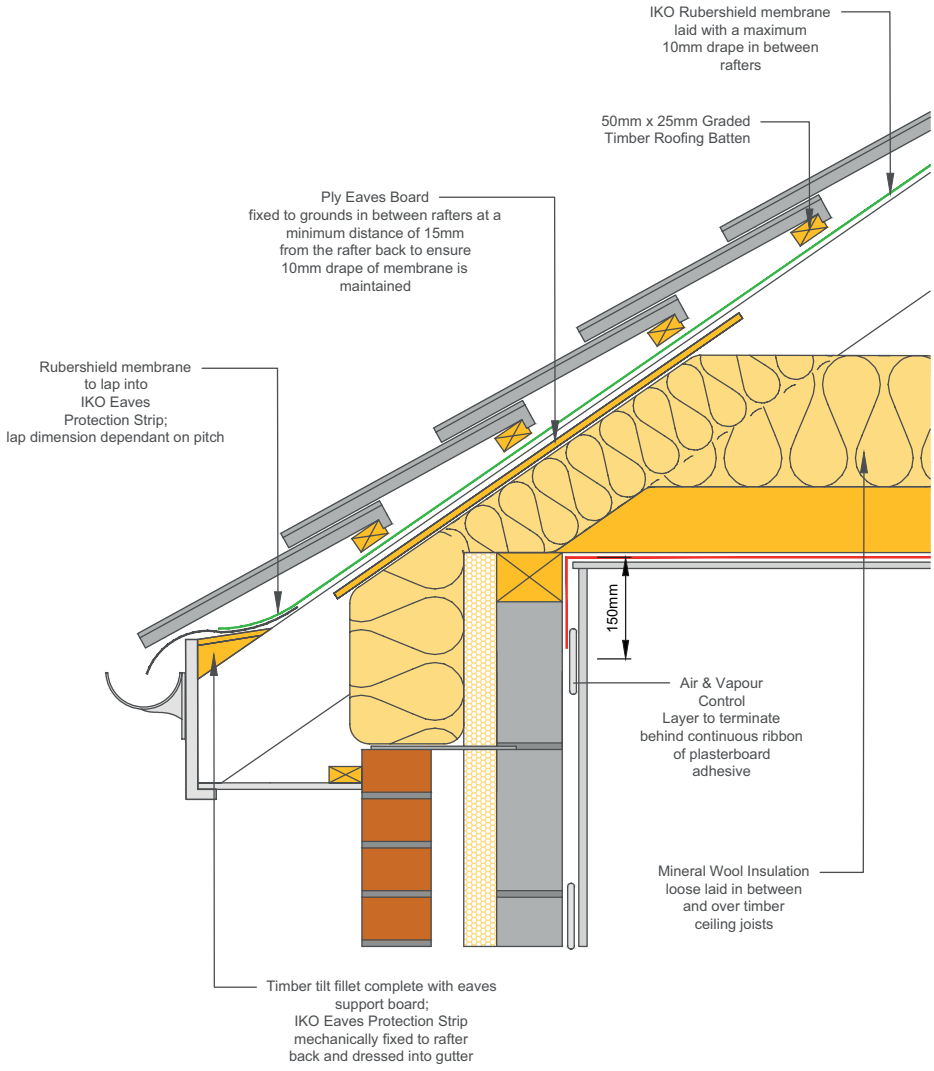


Ridges: Unventilated voids



- If using a roofing system not considered as 'air open' i.e. Fibre Cement Slates, please consult IKO Technical Services.

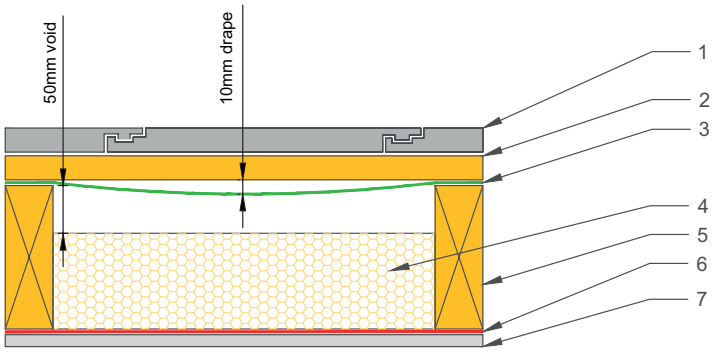
Eaves (with soffit): Unventilated voids



- If using a roofing system not considered as 'air open' i.e. Fibre Cement Slates, please consult IKO Technical Services.

Typical Warm Roof Construction

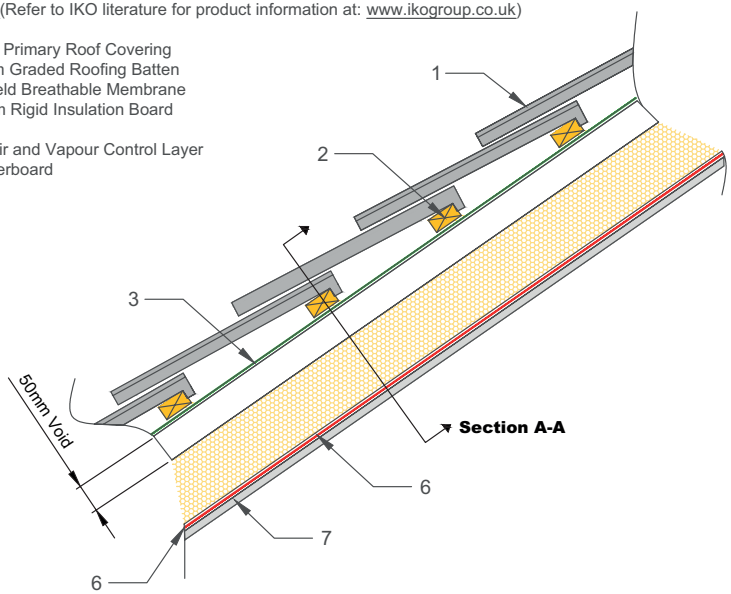
Using partial fill insulation between rafters



Section A-A

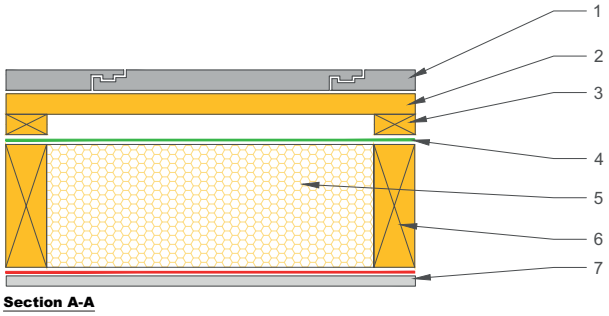
Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Air Permeable Primary Roof Covering
2. 50mm x 25mm Graded Roofing Batten
3. IKO Rubershield Breathable Membrane
4. IKO Enertherm Rigid Insulation Board
5. Timber Rafter
6. Well Sealed Air and Vapour Control Layer
7. 12.5mm Plasterboard



- When insulation is positioned between rafters but does not fill the whole rafter depth, an airspace must be maintained between the underside of the membrane and the top of the insulation to allow a 10mm drape of the membrane, unless counter-battens are used.

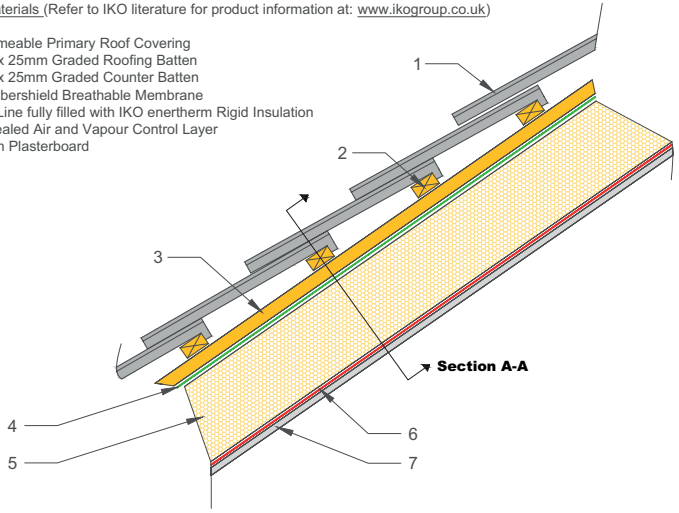
Using full fill insulation between rafters



Section A-A

Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Air Permeable Primary Roof Covering
2. 50mm x 25mm Graded Roofing Batten
3. 50mm x 25mm Graded Counter Batten
4. IKO Rubershield Breathable Membrane
5. Rafter Line fully filled with IKO enertherm Rigid Insulation
6. Well Sealed Air and Vapour Control Layer
7. 12.5mm Plasterboard



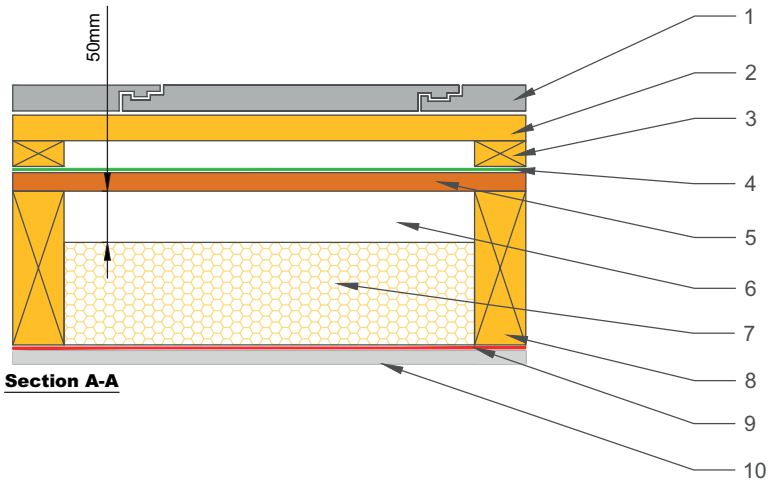
- The membrane should be laid over the rafters and insulation. Counterbattens (minimum 25mm deep) must be nailed directly into the rafters.
- A vapour control layer must be installed on the warm side of the insulation as detailed in BS 5250: 2011 Code of Practice for control of condensation in buildings.
- No ventilation of any void space is required below the Rubershield membrane.
- With clay/concrete tiles or natural slates, air movement is usually sufficient in the space above the membrane (below the tiles/slates) to negate the requirement for additional eaves and ridge ventilation. However, when using close fitting fabricated slates (e.g. fibre cement) additional eaves and ridge ventilation is recommended above the membrane.

Insulation positioned at rafter level with timber sarking

- When using timber sarking, which has a high resistance to the transmission of water vapour, it is advisable to conduct a condensation risk analysis.
- IKO Rubershield membranes can be laid fully supported over suitable rigid sarking boards or sheets specified in accordance with BS5534:2014.
- For sheet sarking (i.e. plywood, OSB) which is considered nominally airtight, ventilation must be provided beneath the sheet sarking in accordance with the requirements of BS5250:2011. In addition to this, the roof construction must include a well-sealed Air and Vapour Control Layer to the warm side to avoid condensation. In relation to Wind Uplift resistance, as IKO membranes are tested to BS5534:2014, they are suitable for use across all wind zones at any batten gauge when using an air tight sarking board for support.
- In instances involving the use of individual softwood boards spaced a nominal 5mm apart, it is not necessary to provide ventilation beneath the boards when using an IKO Rubershield Breathable Membrane but a well-sealed Air and Vapour Control Layer to the warm side of the construction must be included to avoid condensation. It should be noted that this choice of sarking material is not considered as air tight and resultantly the breathable membrane specified must be treated as unsupported in its Wind Zone rating.

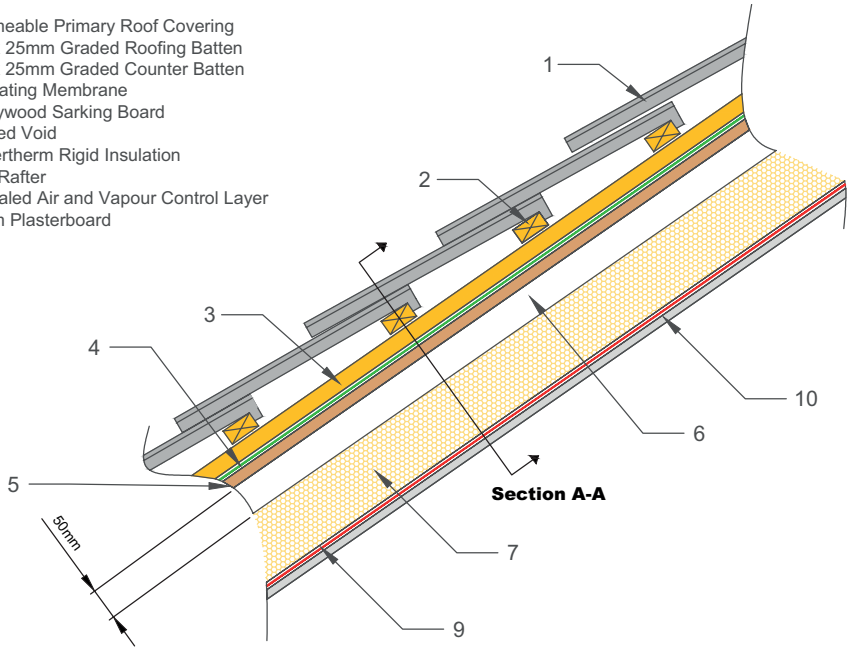
  In both instances counter battens should be installed above the membrane to assist with drainage and batten space ventilation.

Insulation positioned at rafter level with timber sarking

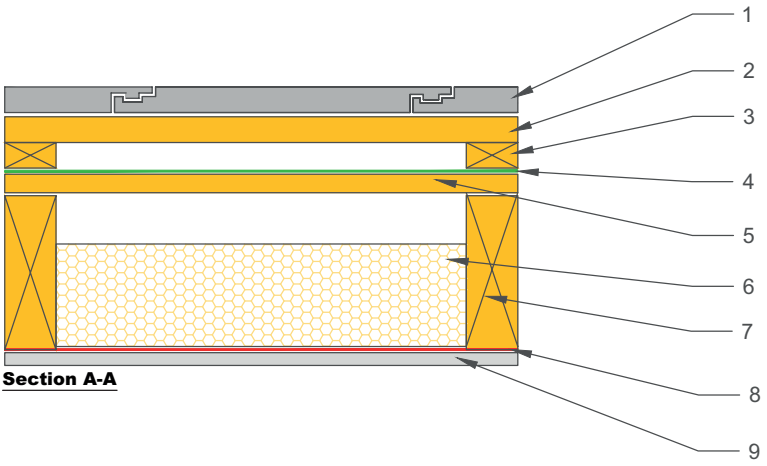


Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Air Permeable Primary Roof Covering
2. 50mm x 25mm Graded Roofing Batten
3. 50mm x 25mm Graded Counter Batten
4. Underslating Membrane
5. OSB/Plywood Sarking Board
6. Ventilated Void
7. IKO enertherm Rigid Insulation
8. Timber Rafter
9. Well Sealed Air and Vapour Control Layer
10.12.5mm Plasterboard

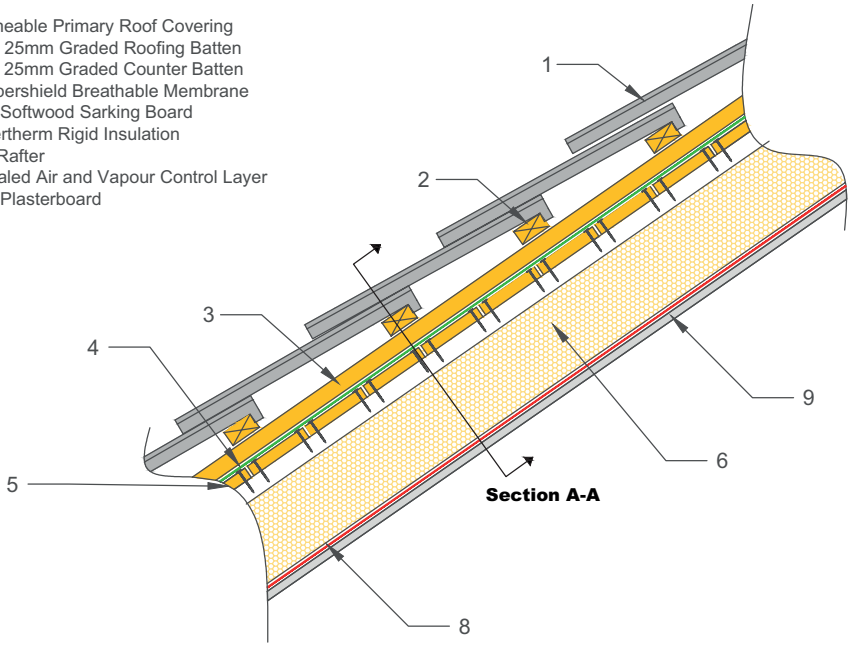


Insulation positioned at rafter level with timber sarking with ventilated void



Key to Materials (Refer to IKO literature for product information at: www.ikogroup.co.uk)

1. Air Permeable Primary Roof Covering
2. 50mm x 25mm Graded Roofing Batten
3. 50mm x 25mm Graded Counter Batten
4. IKO Rubershield Breathable Membrane
5. 150mm Softwood Sarking Board
6. IKO enertherm Rigid Insulation
7. Timber Rafter
8. Well Sealed Air and Vapour Control Layer
9. 12.5mm Plasterboard

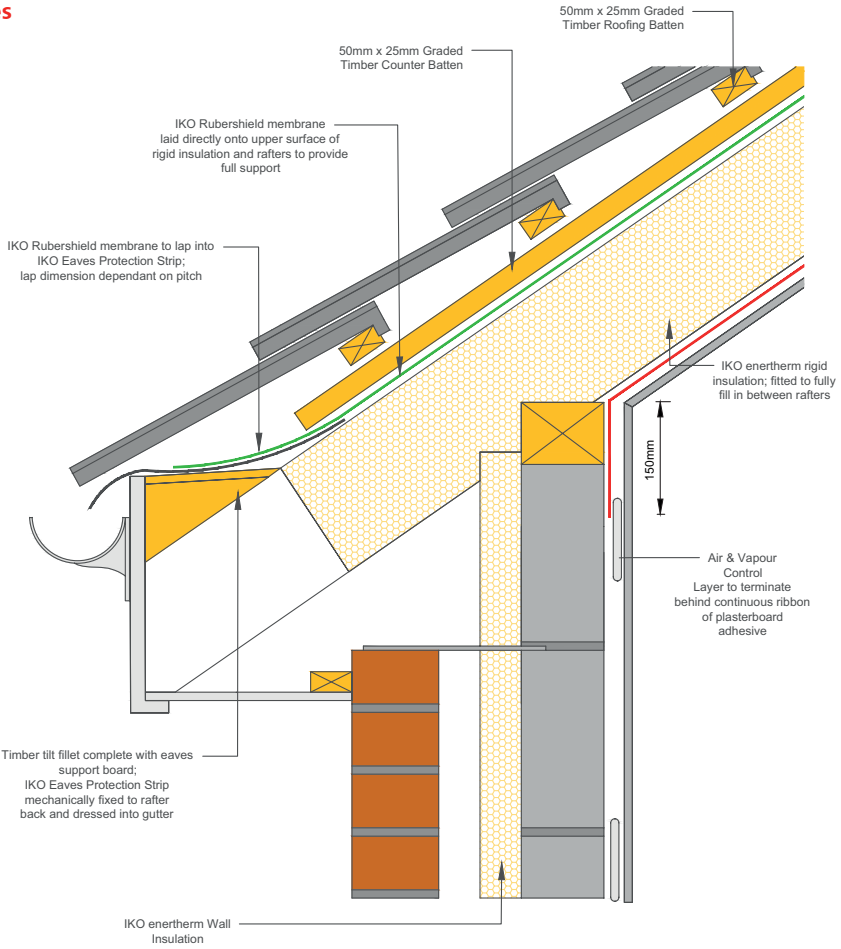


Typical Warm Roof Design Details

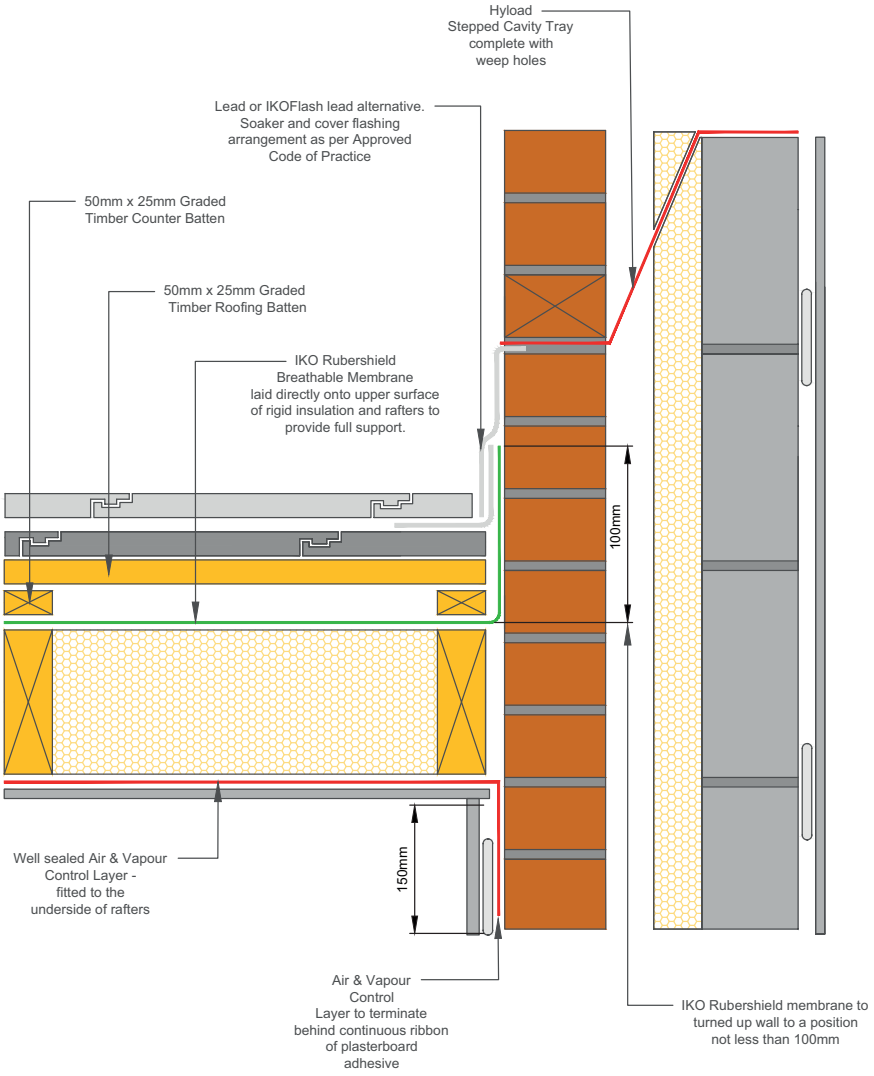
Some typical warm roof detailing examples are given here. Drawings should be used in conjunction with information available in Building Regulations and British Standards.

Further advice, regarding the detailing of the Rubershield membrane is available from IKO's Technical Services Department.

Eaves

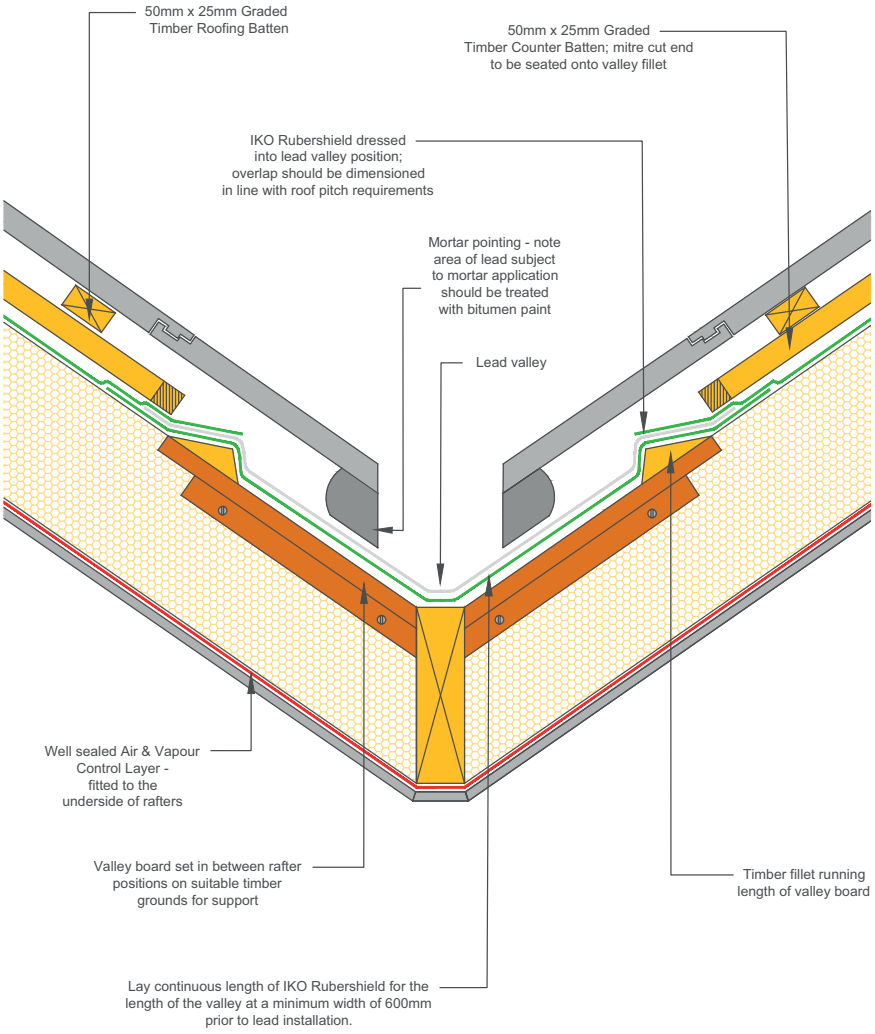


Abutments

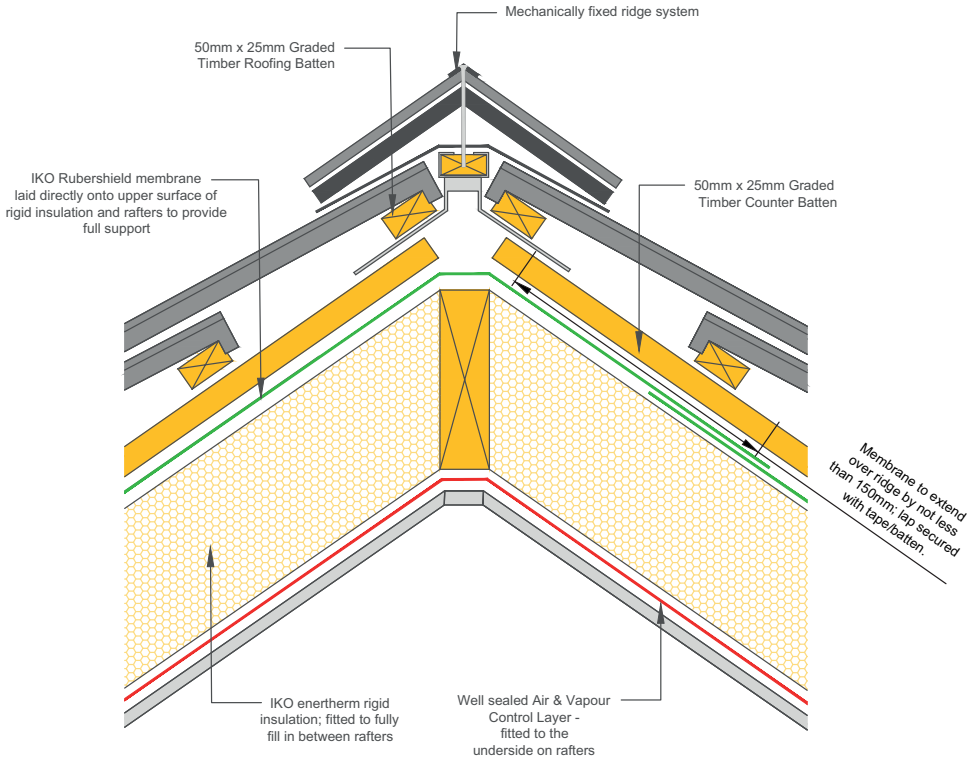


- Ensure ends of tiling battens are adequately supported on last counter-batten.
- Turn Rubershield up against abutment wall by not less than 100mm and seal to wall with Rubershield Jointing Tape.
- Fix lead flashing Code 4 or 5, in accordance with current Codes of Practice.

Valleys (with lead lining)



Ridges


Mechanically fixed ridge system
50mm x 25mm Graded Timber Roofing Batten
IKO Rubershield membrane laid directly onto upper surface of rigid insulation and rafters to provide full support
50mm x 25mm Graded Timber Counter Batten
Membrane to extend over ridge by not less than 150mm; lap secured with tape/batten.
IKO enertherm rigid insulation; fitted to fully fill in between rafters
Well sealed Air & Vapour Control Layer - fitted to the underside on rafters

Summary of test results for wind uplift resistance of IKO Roof Underlays to BS5534 Annex A

Underlay type	Wind Uplift Pressure (Pa)			
	Battened lap		Taped lap*	
	345mm batten gauge	250mm batten gauge	345mm batten gauge	250mm batten gauge
Rubershield ECO	696	1244	1391	3278
Rubershield ECO EXTRA	752	1512	1679	Not tested
Rubershield PRO	876	1711	1944	Not tested
Rubershield PRO EXTRA	1072	2031	2320	Not tested

*Laps were taped using Rubershield Jointing tape

IKO PLC

Appley Lane North
Appley Bridge
Wigan
Lancashire WN6 9AB
www.ikogroup.co.uk

Member of the IKO Group

Sales Support

t: 01257 256 865

f: 01257 251 855
sales.uk@iko.com

Technical Services

t: 01257 256 864

f: 01257 252 514
technical.uk@iko.com