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### Agrément Certificate

16/5299

Product Sheet 3 Issue 2

## KINGSPAN KOOLTHERM RANGE FOR FLOORS, WALLS AND PITCHED ROOFS

### KOOLTHERM K107

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Kooltherm K107, rigid phenolic (PF) foam boards with composite perforated foil facings for pitched roof applications, for use as insulation installed over, between and over, between, or between and under rafters, in tiled or slated pitched roofs not exceeding 70 degrees in pitch, in new or existing domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

#### The assessment includes

##### Product factors:

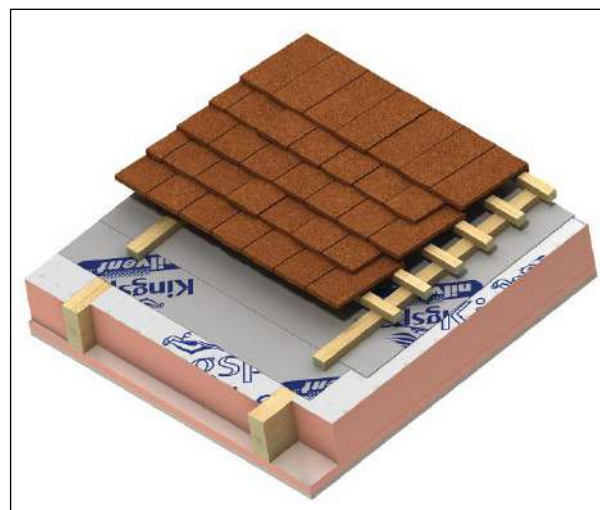
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

##### Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

##### Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



#### KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 15 October 2024

Date of original issue: 1 March 2017

Certificate amended on 31 October 2024 to correct format.

Hardy Giesler  
Chief Executive Officer

*This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.*

*The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 3537).*

**Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.**

**The Certificate should be read in full as it may be misleading to read clauses in isolation.**

*Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

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## SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

### Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Kooltherm K107, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



#### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>B3(4)</b>	<b>Internal fire spread (structure)</b>
Comment:	The product can contribute to satisfying this Requirement. See section 2 of this Certificate.	
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:	The product can contribute to satisfying this Requirement. See section 3 of this Certificate.	
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:	The product can contribute to satisfying this Requirement; however, compensating fabric/service measures may be required. See section 6 of this Certificate.	
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and Workmanship</b>
Comment:	The product is acceptable. See sections 8 and 9 of this Certificate.	
<b>Regulation:</b>	<b>25B</b>	<b>Nearly zero-energy requirements for new buildings</b>
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26C</b>	<b>Target primary energy rates for new buildings (applicable to England only)</b>
<b>Regulation:</b>	<b>26C</b>	<b>Minimum energy efficiency rating (applicable to Wales only)</b>
Comment:	The product can contribute to satisfying these Regulations; however, compensating fabric/service measures may be required. See section 6 of this Certificate.	



#### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)</b>	<b>Fitness and durability of materials and workmanship</b>
Comment:	The product is acceptable. See sections 8 and 9 of this Certificate.	
<b>Regulation:</b>	<b>9</b>	<b>Building standards - construction</b>
<b>Standard:</b>	<b>3.15</b>	<b>Condensation</b>
Comment:	The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.3 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> , 3.15.5 <sup>(1)</sup> and 3.15.7 <sup>(1)</sup> . See section 3 of this Certificate.	
<b>Standard:</b>	<b>6.1(b)(c)</b>	<b>Energy demand</b>
Comment:	The product can contribute to satisfying this Standard, with reference to clause 6.1.1 <sup>(1)</sup> however, compensating fabric/service measures may be required. See section 6 of this Certificate.	
<b>Standard:</b>	<b>6.2</b>	<b>Building insulation envelope</b>
Comment:	The product can contribute to satisfying this Standard, with reference to clauses or parts of clauses 6.2.1 <sup>(1)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(1)</sup> , 6.2.9 <sup>(1)</sup> , 6.2.10 <sup>(1)</sup> , 6.2.11 <sup>(1)</sup> and 6.2.12 <sup>(1)</sup> however, compensating fabric/service measures may be required. See section 6 of this Certificate.	

Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)</sup> , 7.1.6 <sup>(1)</sup> and 7.1.7 <sup>(1)</sup> . See section 6 of this Certificate.
Regulation:	12	<b>Building standards - conversion</b>
Comment:		Comments made in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).



## The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(1)(a)	<b>Fitness of materials and workmanship</b>
Comment:	i)(iii)(b) (i)(ii)	The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	29	<b>Condensation</b>
Comment:		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	35(4)	<b>Internal fire spread - structure</b>
Comment:		The product can contribute to satisfying this Regulation. See section 2 of this Certificate.
Regulation:	39(a)(i)	<b>Conservation measures</b>
Regulation:	40(2)	<b>Target carbon dioxide emission rate</b>
Regulation:	43(1)(2)	<b>Renovation of thermal elements</b>
Regulation:	43B	<b>Nearly zero-energy requirements for new buildings</b>
Comment:		The product can contribute to satisfying these Regulations; however, compensating fabric/service measures may be required. See section 6 of this Certificate.

## Additional Information

### NHBC Standards 2024

In the opinion of the BBA, Kooltherm K107, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.2 *Pitched Roofs*.

## Fulfilment of Requirements

The BBA has judged Kooltherm K107 to be satisfactory for use as described in this Certificate. The product has been assessed for use as insulation within tiled or slated pitched roofs (where the pitch is less than 70 degrees), in conjunction with internal lining board, roof tile underlay, timber counter battens and tiling battens, in new and existing domestic buildings.

## ASSESSMENT

### Product description and intended use

The Certificate holder provided the following description for the product under assessment. Kooltherm K107 consists of rigid thermoset phenolic foam boards with perforated composite foil facings.

The product has the nominal characteristics given in Table 1.

*Table 1 Nominal characteristics*

Characteristic (unit)	
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25 to 150
Edge profile	Square

#### Ancillary Items

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- Roof tile or slate finish
- vapour permeable roof underlay
- treated timber battens / rafters
- air and vapour control layer (AVCL)
- helical fixings / galvanized slab nails
- aluminium tape
- Kooltherm K118 insulated plasterboard (the subject of BBA Certificate 16/5299 Product Sheet 8).

#### Application

The product is for use as insulation in the following applications: on new and existing domestic buildings on tiled or slated pitched roofs, with a roof pitch of between 10° and 70°.

- Over rafters
- Over and between rafters
- Between rafters
- Between and under rafters.

## Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

### 1 Mechanical resistance and stability

Data were assessed for the following characteristic.

#### 1.1 Behaviour under loading

1.1.1 The compressive strength of the product was assessed, and the result of a test is given in Table 2.

*Table 2 Compression strength*

Product assessed	Assessment method	Requirement	Result
Kooltherm K107	BS EN 826 : 2013	Value achieved	≥ 100 kPa

## 2 Safety in case of fire

Data were assessed for the following characteristic.

### 2.1 Reaction to Fire

2.1.1 The reaction to fire classification is given in Table 3.

*Table 3 Reaction to fire classification*

Product assessed	Assessment method	Requirement	Result
Kooltherm K107	BS EN 13166 : 2012	Value declared	F

2.1.2 Designers must refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for cavity closers and barriers and fire stopping at junctions.

## 3 Hygiene, health and the environment

Data were assessed for the following characteristics.

### 3.1 Water vapour permeability

3.1.1 The resistance to water vapour diffusion was assessed and the results are given in Table 4.

*Table 4 Water vapour resistivity / resistance*

Material	Assessment method	Requirement	Result
Phenolic insulation core	BS EN 12086 : 2013	Value achieved	18.5 MN·s·g <sup>-1</sup> ·m <sup>-1</sup>
Foil facer			0.77 MN·s·g <sup>-1</sup>

## 4 Safety and accessibility in use

Not applicable.

## 5 Protection against noise

Not applicable.

## 6 Energy economy and heat retention

Data were assessed for the following characteristics.

### 6.1 Thermal conductivity

6.1.1 The product was tested for thermal conductivity and the result is given in Table 5.

*Table 5 Thermal conductivity*

Product assessed	Insulation thickness	Assessment method	Requirement	Result
Kooltherm K107	25 mm to 150 mm	BS EN 13166 : 2012	Declared value ( $\lambda_D$ )	0.019 W·m <sup>-1</sup> ·K <sup>-1</sup>

### 6.2 Thermal performance

6.2.1 The facer was tested for emissivity and the result is given in Table 6.

**Table 6 Aged emissivity**

Product assessed	Assessment method	Requirement	Result
Foil facing	Aged emissivity to BS EN 15976 : 2011	Declared value	0.05

6.2.2 The U value of a completed roof will depend on the insulation thickness, the number and type of fixings, and the roof structure and its internal finish. Example U value calculations are given in Table 7.

**Table 7 Example U values ( $W \cdot m^{-2} \cdot K^{-1}$ ) for pitched roofs**

Target U value ( $W \cdot m^{-2} \cdot K^{-1}$ )	Kooltherm K107 insulation thickness requirement (mm)		
	Over Rafters <sup>(1)</sup>	Between and over Rafters <sup>(2)</sup>	Between and under rafters <sup>(3)</sup>
0.09	– <sup>(4)</sup>	150 + 90	– <sup>(4)</sup>
0.11	– <sup>(4)</sup>	150 + 60	100 + 115
0.12	150	150 + 50	100 + 100
0.13	140	150 + 40	100 + 85
0.15	120	130 + 25	100 + 60
0.16	110	115 + 25	100 + 55
0.18	95	95 + 25	100 + 40
0.20	85	80 + 25	100 + 25

- (1) Pitched roof construction - concrete tiles on 25 mm timber tile battens (well ventilated) on low-resistance (LR) breather membrane, K107 insulation secured with 11 fixings per  $m^2$  - stainless steel ( $\lambda = 17 W \cdot m^{-1} \cdot K^{-1}$ ) with a cross-sectional area of  $9 mm^2$ , on 47 x 150 mm timber rafters (11.75%;  $\lambda = 0.13 W \cdot m^{-1} \cdot K^{-1}$ ), with a low-e ( $\epsilon = 0.05$ ) air cavity between the timbers, AVCL and 12.5 mm plasterboard ( $\lambda = 0.25 W \cdot m^{-1} \cdot K^{-1}$ ).
- (2) Pitched roof construction - concrete tiles on 25 mm timber tile battens (well ventilated) on low-resistance (LR) breather membrane, K107 insulation secured with 11 fixings per  $m^2$  - stainless steel ( $\lambda = 17 W \cdot m^{-1} \cdot K^{-1}$ ) with a cross-sectional area of  $9 mm^2$ , on 47 x 150 mm timber rafters (11.75%;  $\lambda = 0.13 W \cdot m^{-1} \cdot K^{-1}$ ), K107 cut tightly between the timbers remaining space is a low-e ( $\epsilon = 0.05$ ) air cavity between the timbers, AVCL and 12.5 mm plasterboard ( $\lambda = 0.25 W \cdot m^{-1} \cdot K^{-1}$ ).
- (3) Pitched roof construction - concrete tiles on 25 mm timber tile battens (well ventilated) on low-resistance (LR) breather ~ membrane, 50 mm clear well vented cavity above the K107 insulation, installed tightly against 47 x 150 mm timber rafters (11.75%;  $\lambda = 0.13 W \cdot m^{-1} \cdot K^{-1}$ ), K107 insulation, AVCL and 12.5 mm plasterboard ( $\lambda = 0.25 W \cdot m^{-1} \cdot K^{-1}$ ) secured with 14.58 fixings per  $m^2$  - mild steel ( $\lambda = 50 W \cdot m^{-1} \cdot K^{-1}$ ) with a cross-sectional area of  $10.46 mm^2$ .
- (4) See section 6.2.4

6.2.3 The product can contribute towards a construction satisfying the national Building Regulations in respect of energy economy and heat retention.

6.2.4 For improved energy or carbon savings, designers must consider appropriate fabric / service measures.

## 7 Sustainable use of natural resources

Not applicable.

## 8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in this product were assessed.

8.2 The product was tested for dimensional stability and the result is given in Table 8.

**Table 8 Dimensional stability**

Product assessed	Assessment method	Requirement	Result
Kooltherm K107	BS EN 1604 : 2013 (70°C and 90-100% RH for 48 hours)	BS EN 13166 : 2012 Length, width and thickness = $\leq 1.5\%$ change	Pass

### 8.3 Service life

Under normal service conditions, the product will have a life equivalent to the structure in which it is incorporated, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

## PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

## 9 Design, installation, workmanship and maintenance

### 9.1 Design

9.1.1 The design process was assessed, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 Roofs must be designed and constructed in accordance with the relevant clauses of BS 5250 : 2021, BS 5534 : 2014, BS 8212 : 1995 and BS EN 1995-1-1 : 2004 and its UK National Annex.

9.1.3 Design wind loading will depend largely on the building geometry and its geographical location and must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Snow loadings must be calculated in accordance with BS EN 1991-1-3 : 2003 and its UK National Annex.

9.1.4 The Certificate holder and fixing manufacturer must advise on the use of the correct proprietary fixings and fixing capacity, but such advice is outside of the scope of this Certificate. When considering this and calculating the fixing spacing required to resist the calculated loadings, the requirements of BS EN 1995-1-1 : 2004 and its UK National Annex must be followed.

9.1.5 Vapour permeable roof tile underlays used in conjunction with the product must have a current BBA Certificate and must be used in accordance with, and within the limitations of, that Certificate.

9.1.6 It is essential that detailing and jointing of the boards achieves a convection-free envelope of high vapour resistance. Any gaps must be filled and/or taped. Ridges, abutments and penetrations must also be sealed. Flue pipes passing through the insulation must be suitably sleeved.

9.1.7 A ventilated air space of minimum depth 25 mm may be required between the underside of the roof tile underlay (at the lowest point of the maximum allowable 15 mm drape) and the upper face of the insulation board, dependent on the specification of the roof tile underlay used.

9.1.8 Calculations of the thermal transmittance (U value) of a roof must be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2019, using the thermal conductivity ( $\lambda_D$  value) from Table 5.

9.1.9 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration and the detailed guidance can be found in the documents supporting the national Building Regulations must be followed.

### Interstitial condensation

9.1.10 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021.

9.1.11 When installed with tightly butted joints and filled/sealed gaps and joints, the product will provide a continuous convection-free envelope of high vapour resistance. Therefore, a suitable vapour-permeable (low resistance - LR) roof tile underlay may be laid over the insulation boards without a ventilated air space, unless the tiles/slates are tight fitting as defined in BS 5250 : 2021. When using a high resistance (HR) underlay, the space below it must be ventilated in accordance with BS 5250 : 2021 with a minimum 25 mm air gap between the top of the insulation board and the lowest point of the maximum allowable 15 mm roof underlay drape.

9.1.12 Where the product is installed in a roof with either a horizontal or sloping ceiling (ie room-in-the-roof), a 'warm roof' space is created, and ventilation should be designed in accordance with BS 5250 : 2021. However, any insulation in a horizontal ceiling should be removed.

9.1.13 Where high humidity may be expected, an air and vapour control layer (AVCL) with sealed and lapped joints, must also be installed unless a site-specific condensation risk analysis in accordance with BS 5250 : 2021 indicates otherwise.

### **Surface condensation**

9.1.14 In England and Wales, roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.35 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point, and the junctions with walls are designed in accordance with section 9.1.9 of this Certificate.

9.1.15 In Scotland, roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $1.2 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point. Guidance may be obtained from BS 5250 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.9 of this Certificate.

### **9.2 Installation**

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate, the Certificate holder's instructions and the relevant clauses of BS 5534 : 2014. A summary of instructions and guidance is provided in Annex A.

9.2.3 During installation, care must be taken to ensure that the product is not subjected to any construction or foot traffic loads. Roof timbers of adequate strength must be used to support such loads.

### **9.3 Workmanship**

Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or contractor, experienced with this type of product.

### **9.4 Maintenance and repair**

Once installed, provided that the roof tiles/slates are maintained in a weathertight condition, maintenance is not required.

## **10 Manufacture**

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.



10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of the production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

## **11 Delivery and site handling**

11.1 The Certificate holder stated that the product is delivered to site in packaging bearing a label with the product name, Certificate holder's name and characteristics.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Ideally, the boards should be stored inside. If outside storage is necessary, boards must be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin.

11.2.2 Boards that have been allowed to get wet or that are damaged must not be used.

11.2.3 Nothing must be stored on top of the boards.

11.2.4 The boards must not be exposed to a naked flame or other ignition sources, or to solvents or other chemicals.

## ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the Certificate.

### Construction (Design and Management) Regulations 2015

### Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

### UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the product in accordance with Designated Standard EN 13166 : 2012.

### CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard EN 13166 : 2012.

### Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by CIBSE Certification Limited, Certificate number 0001QMS-0.

### Additional information on installation

- A.1 Care must be taken to prevent damage, particularly at edges and when handling the product in windy conditions.
- A.2 Cutting may be carried out either by using a fine-toothed saw, or by scoring with a sharp knife, snapping the product over a straight edge and then cutting the facing on the other side.
- A.3 Accurate trimming is essential to achieve close-butting joints and continuity of insulation.
- A.4 The product has insufficient nail-holding ability to be considered as an alternative to timber sarking.
- A.5 When installing between rafters, small gaps between the rafters and the product should be filled with expanding polyurethane foam.
- A.6 Foil-faced or vapour check plasterboard must be provided with supports (noggings) along all edges.
- A.7 The roof tile underlay is fixed under the counter battens (Figure 1) or over the rafters (Figure 2), tiling battens may then be fixed horizontally, at spacings to suit the tiles or slates specified.

## **Procedure**

### **Insulation above rafters**

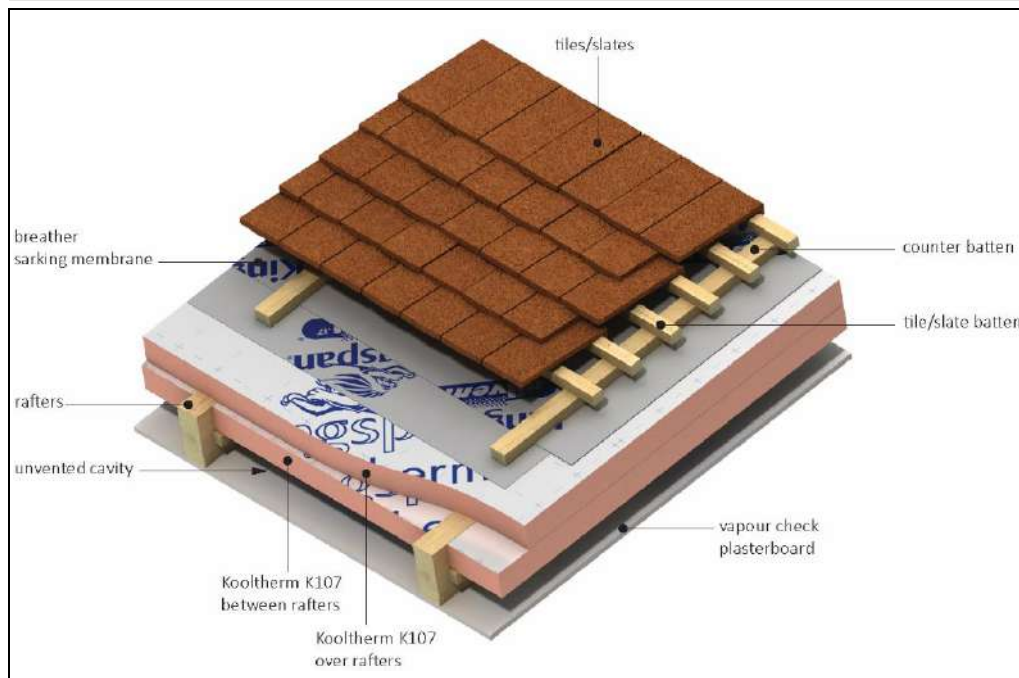
A.8 When installing over the rafters, it is not necessary to tape the product joints; a preservative-treated stop rail should be secured to the rafters at the eaves.

A.9 The product is laid on to rafters, starting at the stop rail and working towards the ridge so it covers the whole roof area. The product should be tightly butted and fixed in a staggered pattern. Product joints should be butted over rafters, not mid-span. It is important to ensure a tight fit between the product, product and rafters and other detailed elements. At ridges and verges, the product should be cut to achieve a close-butt joint.

A.10 Treated counter battens are fixed above the insulation boards down the line of each rafter, run from eaves to ridge using the helical fixings at a minimum spacing of 300 mm centres. A minimum 37 mm fixing penetration into the rafter should be maintained. Short lengths of counter batten should be tightly butted.

#### Insulation between and over rafters

*Figure 1 Between and over rafter insulation*



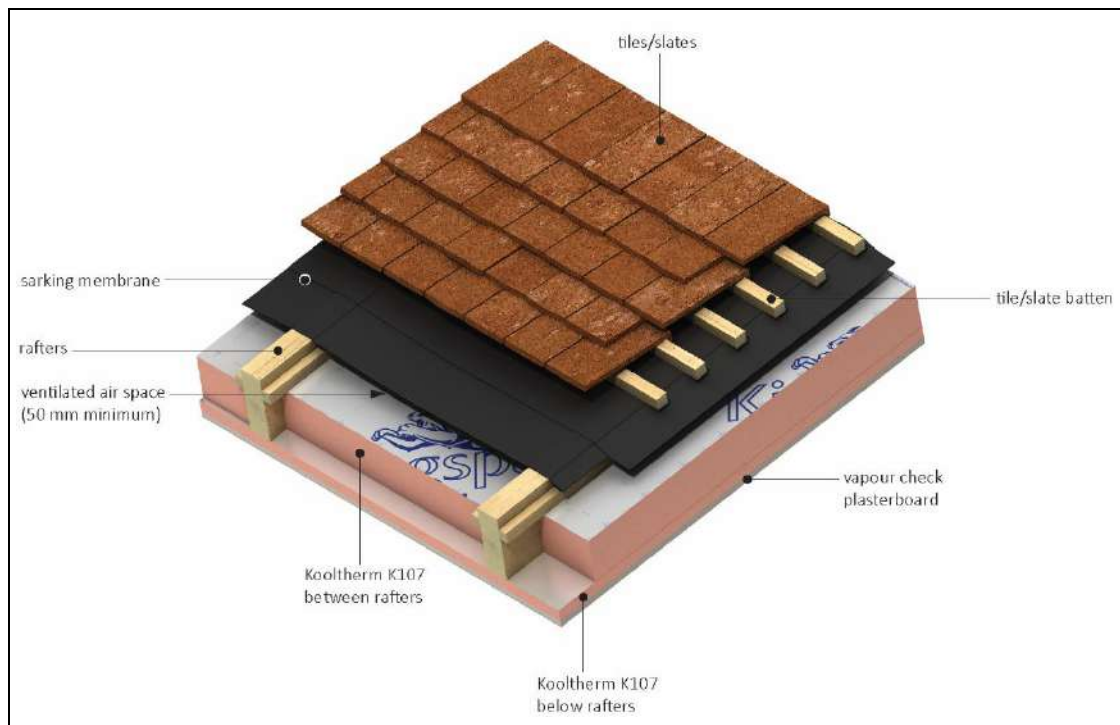
A.11 The product is cut to fit tightly between rafters and is supported on timber stop battens. Over rafter boards are laid as described in sections A8 to A10. The product is secured down the length of the rafters and fixed at a minimum spacing of 300 mm centres through the counter batten and insulation.

#### Insulation between and under rafters

A.12 The product may be attached to the underside of rafters.

A.13 The product is temporarily fixed with clout-head nails and joints butted and foil taped. Appropriate internal lining panels may then be fixed through the insulation into the underside of the rafters.

*Figure 2 Between and under rafter insulation*



### **Finishing**

A.14 The vapour permeable roof tile underlay (sarking membrane) should be installed in accordance with the manufacturer's instructions and the appropriate BBA Certificate.

A.15 Roof tiles or slates are installed in accordance with the relevant clauses of BS 5534 : 2014.

A.16 Internal lining panels appropriate to the application and required decoration are installed.

## Bibliography

BRE Report BR 262 : 2002 *Thermal insulation: avoiding risks*

BRE Report BR 443 : 2019 *Conventions for U-value calculations*

BS 5250 : 2021 *Management of moisture in buildings - Code of practice*

BS 5534 : 2014 + A2 : 2018 *Code of practice for slating and tiling (including shingles)*

BS 8212 : 1995 *Code of practice for Dry lining and portioning using gypsum plasterboard*

BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*

NA to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*

NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

NA to BS EN 1995-1-1 : 2004 + A1 : 2008 UK National Annex to *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

BS EN 826 : 2013 *Thermal insulating products for building applications — Determination of compression behaviour*

BS EN 1604 : 2013 *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*

BS EN 12086 : 2013 *Thermal insulating products for building applications — Determination of water vapour transmission properties*

BS EN 15976 : 2011 *Flexible sheets for waterproofing - Determination of emissivity*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN 13166 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made phenolic foam (PF) products — Specification.*

## Conditions of Certificate

### Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

#### British Board of Agrément

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