Saint-Gobain Isover UK
UK Commercial Centre
Leake Road
Gotham
Nottinghamshire NG11 0LB
Tel: 0115 9698007 Fax: 0115 983 1675
e-mail: isover.enquiries@saint-gobain.com
website: www.isover.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
14/5092
Product Sheet 1

ISOVER MEMBRANES

ISOVER VARIO KM DUPLEX MEMBRANE

This Agrément Certificate Product Sheet[1] relates to the Isover Vario KM Duplex Membrane, a polyamide sheet reinforced with non-woven polypropylene, for use as a humidity-variable vapour control/air barrier layer in roofs, floors and walls on the warm side of the insulation in timber, steel and masonry new build and refurbishment constructions.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Risk of condensation — the product will reduce the risk of interstitial condensation (see section 6).

Air permeability — the product is an air barrier and can reduce heat loss by air infiltration (see section 7).

Strength — the product has adequate strength to resist damage during installation (see section 8).

Durability — the product will have a service life comparable to other similar elements of construction (see section 11).

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 First issue: 2 April 2014

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Isover Vario KM Duplex Membrane, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

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

Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to limiting the risk of interstitial condensation. See sections 6.4 and 6.5 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to meeting this Requirement. See section 7 this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	26	CO_2 emission rates for new buildings
Comment:		The product can contribute to meeting this Regulation. See section 7 this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product satisfies the requirements of this Regulation. See section 11 and the *Installation* part of this Certificate.
Regulation	9	Building standards applicable to construction
Standard:	3.15	Condensation
Comment:		The product can contribute to limiting the risk of interstitial condensation, with reference to clauses 3.15.1[1][2] and 3.15.5[1][2] of this Standard. See sections 6.4 and 6.5 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		See section 7 this Certificate with reference to clauses 6.1.1[1], 6.1.2[2], 6.1.6[1], 6.2.4[1], 6.2.6[2], 6.2.10[1] and 6.2.12[2].
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to meeting 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[1][2] [Aspects 1[1][2] and 2[1]], 7.1.6[1][2] [Aspects 1[1][2] and 2[1]] and 7.1.7[1][2] [Aspect 1[1][2]]. See section 7 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for this product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1[1][2] and Schedule 6[1][2].

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate
Regulation:	29	Condensation
Comment:		The product can contribute to limiting the risk of interstitial condensation. See sections 6.4 and 6.5 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The product can contribute to meeting this requirement. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard EN 13984 : 2004. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 The Isover Vario KM Duplex Membrane is a vapour control layer with a resistance to vapour diffusion that depends on the moisture content of the air adjacent to the membrane. In summer conditions, and in winter conditions where solar radiation is incident on the element, the vapour resistance is reduced and facilitates the inward diffusion/ escape of accumulated moisture.

1.2 The Isover Vario KM Duplex Membrane is a is a polyamide sheet, reinforced with non-woven polypropylene. The nominal characteristics of the membrane are:

Mass per unit area* ($g \cdot m^{-2}$)	80
Roll length*(m)	40
Roll width* (m)	1.5
Weight of roll (kg)	>4.8
Colour	white with black and yellow branding
Tensile strength* (N per 50 mm)	≥ 110 (MD/CD)
Nail tear* (N)	≥ 50
Water vapour transmission range* S_d (m)	0.3 to 5.0

1.3 Ancillary items necessary for installation of the product and included in this assessment are:

- Vario KBI Tape – a single-sided adhesive tape for jointing seams
- Vario DS Sealant – a durable elastic sealant for use at overlaps
- Vario MultiTape – flexible and ductile adhesive tape for use in forming airtight joints around junctions and penetrations
- Vario MultiTape SL – single-sided flexible adhesive tape with a split release strip, for use in forming airtight joints around junctions and penetrations
- Vario ProTape – double-sided tape for use in fixing to non-timber building elements

1.4 Other items or components which may be used with the product, but which are outside the scope of this Certificate, are:

- Vario TightTec junction components – for airtight seals of all corners
- Mangete Passelec Gasket detail – rubber self-adhesive gasket to create airtight seals around pipework
- Vario Stos Penetration Gasket – rubber gasket for use with the membrane.

2 Manufacture

2.1 The Isover Vario KM Duplex Membrane is manufactured by the lamination of a printed polyamide sheet to a polypropylene fleece by adhesive bonding, followed by slitting to the correct width.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out 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.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by IQnet and Quality Austria (Certificate AT-00342/0).

3 Delivery and site handling

3.1 Rolls are delivered to site packaged in transparent LDPE film. Each pallet contains 42 rolls packaged in cardboard cartons which bear a label with the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored flat on a smooth, clean dry surface, under cover and protected from direct sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Isover Vario KM Duplex Membrane.

Design Considerations

4 Use

4.1 The Isover Vario KM Duplex Membrane is satisfactory for use as a vapour control layer/air barrier in new build and refurbishment projects in domestic and non-domestic buildings up to and including humidity Class 4. It is installed on the warm side of the insulation, as an alternative to traditional materials, in the following roof, floor and wall specifications:

- at the rafter line in warm slated or tiled pitched timber roof constructions in conjunction with a HR or an LR underlay
- at ceiling level in warm pitched roof constructions
- at ceiling level in slated or tiled pitched cold roof constructions
- in walls in timber, masonry and steel-frame constructions in conjunction with an OSB sheathing board
- suspended floors.

4.2 Further information is given in BRE Report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

4.3 It is essential that proper care and attention is given to maintaining the product's integrity and continuity.

4.4 New elements should incorporate the product on the warm side of the insulation, and the overall construction must be designed and constructed in accordance with the relevant good practice.

4.5 Existing elements must be in a good state of repair with no evidence of rain penetration, damp or frost damage.

5 Practicability of installation

The product is designed to be installed by competent installers who have experience of this type of product.

6 Risk of condensation

6.1 The product is a variable vapour control layer that alters its vapour resistance between an S_d of 0.3 m and 5.0 m according to the direction of heat flow and the relative humidity between each side of the membrane. In summer, the membrane vapour resistance decreases, allowing moisture to pass through the membrane back into the room. In winter, the membrane's vapour resistance increases to minimise vapour transfer into the construction.

6.2 The risk of condensation occurring will depend upon the properties and vapour resistance of other materials used in the construction, the internal and external conditions, and the effectiveness of the product's installation.

6.3 Consideration must be given in the overall installation to minimising penetrations by services. Joints at ceilings/walls must be sealed to offer significant resistance to water vapour transmission. Sealing must be carried out in accordance with the Certificate holder's instructions.

6.4 When the product is installed on the warm side of non-ventilated constructions with diffusion open layers on the outside (eg LR underlay as defined in BS 5250 : 2011), or when constructions are back-ventilated above the insulation layer, no condensation risk analysis is needed, as these constructions are condensation-free.

6.5 When the product is installed on the warm side of the construction with a diffusion-tight layer on the outer face (eg waterproofing membranes, green roofs, HR underlay as defined in BS 5250 : 2011) a dynamic condensation assessment in accordance with BS EN 15026 : 2007 should be carried out for each particular situation, using an appropriate dynamic modelling package and considering parameters of:

- vapour diffusion resistance values of Isover Vario KM Duplex Membrane in section 6.1 of this Certificate
- hygrothermal properties of all other materials in the construction, in particular vapour resistances in the cold side
- type of insulation
- element location, orientation and pitch
- rainfall and water absorption coefficient of the outermost external layer
- shading and solar absorptivity
- internal humidity conditions
- degree of airtightness of the construction.

6.6 Where incidence of solar radiation is low, such as in Scotland, the potential for back drying is reduced and the advice of the Certificate holder should be sought.

7 Air permeability

The product is an air barrier and, when lapped, fixed and taped correctly, can contribute to elements and junctions minimising heat loss by unplanned air infiltration or exfiltration. Guidance in this respect can be found in:

England and Wales – Accredited Construction Details (version 1.0)
Scotland – Accredited Construction Details (Scotland)
Northern Ireland – Accredited Construction Details (version 1.0).

8 Strength

The product has adequate strength to resist damage during installation and subsequent works.

9 Properties in relation to fire

9.1 The product will melt and shrink away from heat, but will burn in the presence of a naked flame. The product is Class E* material in accordance with EN 13501-1 : 2007.

9.2 When used supported, there is a risk that fire can spread if the product is accidentally ignited during building and maintenance works, eg by a roofer's or plumber's torch. As with all types of membrane, care should be taken during building and maintenance to avoid the material being ignited.

9.3 In walls, cavity barriers must be used to satisfy the requirements of the national Building Regulations.

10 Maintenance

As the product is confined within the roof/wall structure and has suitable durability (see section 11), maintenance is not required.

11 Durability

The product is rot-proof, does not tear easily and will have a life equal to that of the element in which it is installed.

12 Reuse and recyclability

The product is made from a mix of polyolefins, which can be recycled.

Installation

13 General

13.1 Installation of the Vario KM Duplex UV Membrane must be in accordance with the Certificate holder's instructions and good building practice.

13.2 Where wood preservatives and damp-proofing treatments containing solvents have been applied, sufficient time must be allowed for solvents to disperse before the product is installed.

13.3 The product is installed with the branded side facing the installer.

14 Procedure

Roofs

14.1 The product is stapled to the sub-construction on the warm side of the insulation. Joints between adjacent sheets of the product are lapped by a minimum of 100 mm and sealed with a strip of Vario KBI Tape.

14.2 At all penetrations and abutments, the product is neatly cut to fit as closely as possible and the joint sealed with Vario DS sealant or Vario ProTape. Vario MultiTape or Vario MultiTape SL is used for sealing at junctions and joints with roof windows, pipes and roof penetrations.

14.3 Internal linings are applied and fixed in the normal manner.

Walls

14.4 The product is rolled out either horizontally or vertically and stapled to the timber studs. Staples should be a minimum of 10 mm wide and 8 mm long and located no more than 150 mm apart.

14.5 The product must be installed with a minimum 100 mm overlap between joints. The 100 mm square pattern on the product can be used to form the overlap.

14.6 Where the product overlaps with solid structures, Vario DS Sealant is used to ensure airtightness. The product is placed onto the sealant ensuring that the mastic bead is not flattened. By running forefingers either side of the sealant, a pinched ridge of mastic is created under the product.

14.7 A further seal of Vario MultiTape is then applied to ensure complete airtightness.

14.8 The Certificate holder's instructions must be followed when sealing corners or around beams, posts, services, wires and windows.

15 Repair

Damage to the product must be repaired with Vario KBI Tape. Extensively damaged areas are made good by overlaying a new sheet and sealing in place with Vario KBI Tape and Vario MultiTape.

Technical Investigations

16 Tests

16.1 An assessment was made of data to EN 13984 : 2004 in relation to:

- dimensions*
- tensile strength and elongation*
- water vapour transmission properties*
- water absorption
- mass per unit area*
- nail tear*
- reaction to fire*
- shear and peel strength of joints*.

16.2 tests were carried out to determine:

- dimensional stability
- air permeability of joints

in order to assess performance in service.

17 Investigations

17.1 Calculations on the risks of interstitial condensation occurring in various constructions were carried out.

17.2 The demonstration of the installation procedures was carried out to assess the ease of installation.

17.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and compositions of materials used.

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS EN 15026 : 2007 *Hygrothermal performance of building components and building elements — Assessment of moisture transfer by numerical simulation*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

EN 13984 : 2004 *Flexible sheets for waterproofing — Plastic and rubber vapour control layers — Definitions and characteristics*

EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

18 Conditions

18.1 This Certificate:

- relates only to the product/system 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.

18.2 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.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system 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.

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

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

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system 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
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk