1.0 INTRODUCTION

1.1 This document applies to dwellings with a cold or warm roof of traditional construction. This does not apply to where a breathable membrane is used with cladding.

1.2 Please read all of the questions below.

1.3 Breathable roofing membrane has been used in building for many years now and, more recently, in cold pitch roof construction without traditional eaves ventilation. The benefit of reduced heat loss and not having to incorporate ventilators has seen their use grow but at the same time has attracted noticeable comment both from supporters of the application and from detractors who favour traditional ventilation solutions.

2.0 TYPES OF BREATHABLE MEMBRANES ARE DEFINED AS FOLLOWS

2.1 Breathable membranes have a water vapour resistance of less than or equal to 0.6MN.s/g
   a) High water vapour resistance membrane (type HR) has a water vapour resistance greater than to 0.25MN.s/g
   b) Low water vapour resistance membrane (type LR) has a water vapour resistance less than 0.25MN.s/g
   c) This document applies to type LR only - in light of this the following document has been prepared to try to answer some of the common questions raised regarding using this type of construction.

3.0 WHAT IS A ROOFING MEMBRANE AND HOW DOES IT WORK?

3.1 The particular membrane in question is typically a micro porous membrane which has a structure sufficiently fine to prevent liquid water penetration in service conditions, but not too fine to prevent water vapour (molecules of water in air) penetration.

3.2 All materials, including vapour control layers, have a finite permeability to water vapour transfer.

3.3 However, in the context of this article, a breathable roofing membrane is a material which, in service conditions, is sufficiently permeable to water vapour transfer to adequately limit the risk of condensation in roofs.
3.4 The function of these membranes is to provide all of the normal demands made on a roof underlay and at the same time allow water vapour egress without making specific provision for ventilation.

**4.0 WHEN DO I NEED TO PROVIDE VENTILATION TO A ROOF FITTED WITH A BREATHEABLE MEMBRANE?**

4.1 It is often wrongly assumed that the breathable membrane is a straightforward replacement for the sarking or more traditional roofing felt normally used to the roof structure and once fitted there is no need to ventilate the roof space.

4.2 As a general rule of thumb however it will be necessary to provide ventilation to a roof void fitted with breathable felt under the following circumstances,

a) The breathable membrane is fitted tight across the rafters and no counter battens are fitted.

b) The new roof fitted with the breathable membrane is linked to an existing roof fitted with traditional felt or the extension results in a combination of different breathable membranes being used.

c) The new roof fitted with the breathable membrane is linked to an existing roof which is already vented.

d) The building does not fully comply with the requirements of Approved Document F, ventilation or BS5250, Control of condensation in buildings.

e) Tight fitting slates and tiles are used.

f) Where it is recommended by the manufacturers or where the BBA certificates requires ventilation. Some breathable felt manufacturers recommend ventilation at ridge level.

g) BBA or BRE certificates not complied with fully

**5.0 CAN THE ROOFING MEMBRANE BE USED ‘SIMPLY’ INSTEAD OF CONVENTIONAL EAVES VENTILATION?**

5.1 Only if a number of measures are taken to limit the ingress of water vapour into the unvented space. In this regard, the roof system must be considered in its entirety, from ceiling to roof tiles, including the following design points:-

a) All penetrations into the roof space must be properly sealed

b) Loft hatches must incorporate effective compressible draught seals

c) The rooms below the ceiling must include provision for the dispersal and rapid dilution of water vapour in accordance with the Building Regulations, including extractor fans in rooms that may experience high humidity

d) All water tanks in the loft space must be covered

e) Any vent pipes should be arranged so that they do not discharge water vapour into the loft space.

f) Cavities closed at plate level to stop vapour transfer to roof space.

g) Where it is proposed to install spotlights/down lighters always refer to the relevant BBA/BRE certificate for guidance.

h) Always check the BBA for the felt to be used to check suitability and how to install in your roof design.
6.0 WHAT ARE THE ADVANTAGES OF USING THE ROOFING MEMBRANE UNVENTED SYSTEM?

6.1 One of the main advantages is reducing the amount of heat lost by air leakage through the ceiling and from the loft space to the outside. Up to 25% of the heat lost through a conventional roof system is by this mechanism.

6.2 The unvented roof system will reduce this mechanism of heat loss, more so if the underlay laps are sealed. In addition, not having to provide eaves and ridge ventilation can help to save time and cost on site and can give more desirable appearance to the finished roof?

7.0 WHAT ARE THE DISADVANTAGES OF USING THE ROOFING MEMBRANE SYSTEM?

7.1 Extra time and care is needed to ensure that penetrations into the ceiling are properly sealed and that the loft space is protected from sources of water vapour, in accordance with the requirements of the certificate.

7.2 If the ceiling is constructed without due attention to sealing joints and around penetrations, the opportunity for moisture ingress into the loft space and consequent risk of condensation occurring is increased, this is also true of conventionally ventilated constructions where the effect of wind movement over the roof can reduce the air pressure in the loft space and ‘suck’ moisture laden warm air from living space into the loft space.

7.3 However, it is recognised that the rate of moisture removal via the ventilated and unventilated approach is not the same. It is therefore important that the ceiling is sealed to an appropriate level.

7.4 Where the membrane is draped between rafters there have been reports of flapping noise in roofs incorporating some types of permeable roofing membranes in certain wind conditions. In a worst case scenario this could result in tiles lifting off the roof surface.

8.0 HOW DURABLE ARE ROOFING MEMBRANE SYSTEMS?

8.1 In normal conditions found in roofs, the membranes are durable and can be expected to have a life comparable to that of traditional roof tile underlay. Specifiers should however follow the requirements of the relevant Certificate relating to the period for which the underlay can be exposed to the elements before slating/tiling and on the use of eaves guards for open eaves construction.

8.2 With regard to water vapour permeability, the BBA assessment included measurements of the effect of heat ageing; effect of UV light exposure and of accelerated dust/debris accumulation and found no discernible reduction in performance.

9.0 DO I NEED A VAPOUR CHECK CEILING?

9.1 Not always but it can help. Most manufacturers recommend a vapour control layer be fitted over bathrooms, utility rooms and kitchens. It is important to remember that vapour will pass through the path of least resistance in a ceiling. Gaps and cracks will provide an effective ‘short cut’ however high the vapour resistance of the rest of the ceiling is.
9.2 We would always recommend that a vapour barrier be installed. This is of particular importance where there are sloping ceilings and/or engineered joists within the roof construction.

**10.0 WHAT DO I DO ABOUT SOURCES OF MOISTURE IN THE LOFT?**

10.1 Water tanks should have lids on and vent pipes arranged to avoid venting moisture into the loft space.

**11.0 DO I NEED TO COUNTER BATTEN?**

11.1 In general, counter battens are not required if the underlay is draped between rafters, i.e. a nominal 10mm. If however it is not draped but pulled taut, counter battens are required. Please refer to specific Certificates for the holders detailed installation instructions. The drape or counter battens are there to allow water vapour to disperse or drain away.

**12.0 DOES THE ROOFING MEMBRANE HAVE TO RUN PARALLEL TO EAVES OR PERPENDICULAR (eaves to ridge)?**

12.1 Traditionally, roof tile underlays are laid in runs parallel to the eaves with subsequent runs ‘weather lapped’ by 150mm. Some Certificate holders have had an alternative approach also assessed, where the underlay is drawn from the eaves, over the ridge down to the eaves on the opposite side of the building. This entails the use of a device to hold the roll of underlay horizontally and allows it to be unwound.

12.2 Due to safety issues the eaves/ridge/eaves method is rarely used. Counter battens are needed to secure laps between adjacent runs of underlay. Users should refer to the relevant Agreement Certificate for full details of this alternative method of installation.

**13.0 WHAT TYPE OF ROOFING BREATHABLE FELT COVERING CAN BE USED?**

13.1 The issued Certificates cover conventional slates and tiles installed to the relevant clauses of BS 5534-1: 2003, Code of practice for slating and tiling (including shingles). Somewhat fitting tiles and slates need special consideration and designers should check with the tile or slate manufacturer in case they have particular design requirements, for example a ventilation space beneath them.

**14.0 WHAT HAPPENS TO CONSTRUCTION MOISTURE? (Water added during the construction process)**

14.1 The amount of construction moisture in a new building depends on the materials used and type of construction. The risk of condensation is however greatest when there is a significant drying out taking place and cold temperatures.

14.2 This may in some circumstances lead to condensation during the first heating season, but should not persist into the second heating season in a properly designed and constructed roof.

14.3 BS5250, Code of practice for the control of condensation in buildings, states you can use a 5mm ridge vent to help improve moisture removal.
15.0 WHAT IS THE DIFFERENCE BETWEEN A ‘NON-VENTILATED’ SYSTEM AND A ‘SEALED SYSTEM’?

15.1 Both systems are non-ventilated but the sealed system includes adhesive tape at all laps in the membrane, penetrations and edge details. Not all membranes are required to be sealed. Seals are normally specified where maximum thermal efficiency is required.