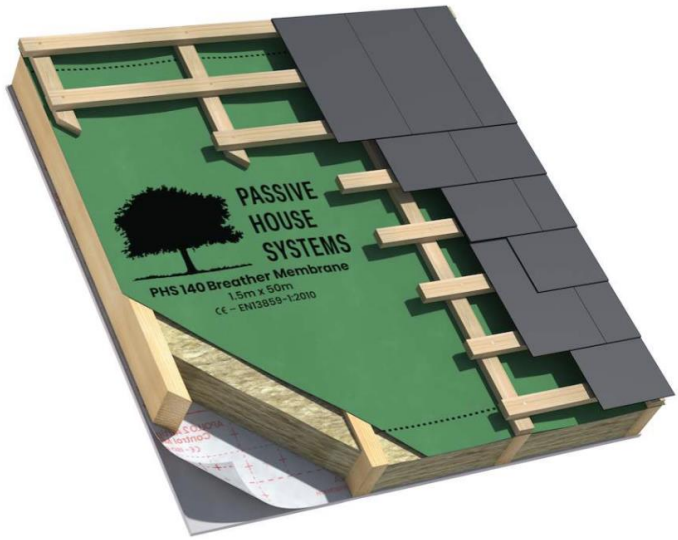
IRISH AGRÉMENT BOARD
CERTIFICATE No. 26/0457

NZEB Products Ltd, T/A Passive House Systems
Unit 5b4 Link Road Business Park,
Ballincollig, Co. Cork. P31 W950
T: 021 487 5297

Passive House Systems
Breathable Roofing Underlays

NSAI Agrément (Irish Agrément Board) is designated by Government to carry out European Technical Assessments.

NSAI Agrément Certificates establish proof that the certified products are **'proper materials'** suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2024.**



PRODUCT DESCRIPTION:
This Certificate relates to the following products from Passive House Systems (referred to as PHS):

- PHS 120gsm Breather Membrane
- PHS 140gsm Breather Membrane
- PHS 160gsm Breather Membrane
- PHS 180gsm Breather Membrane
- PHS 210gsm Breather Membrane

These breathable roofing underlays are for use on tiled or slated pitched roofs. The products are three-layered membranes with outer layers of nonwoven polypropylene thermally bonded to a central breathable polypropylene film.
The breathable roofing underlays are available in a variety of colours.

1. PHS 120gms = Beige
2. PHS 140gms = Green
3. PHS 160gms = Blue
4. PHS 180gms = Burgundy
5. PHS 210gms = Black

The PHS 180gsm and 210gsm PHS Breathable Roofing Underlays are available with an integral adhesive tape, which facilitates 0the formation of sealed laps when the underlay is installed on a roof (see Tables 3 and 4 for wind uplift resistance test results and suitability for use in Irish conditions).

USE:
The PHS Breathable Roofing Underlays are manufactured for use under slates or tiles on open rafter (not fully supported (as referred to within SR28[3]) or fully supported pitched roofs, hereafter referred to as PHS Underlays. The underlays may be used in the following roof systems:

1. Cold ventilated pitched roof systems.
2. Warm non-ventilated pitched roof systems.
3. Cold non-ventilated pitched roof systems.

The installation of these roof systems using PHS Underlays are described in Section 2.3 of this Certificate.
PHS Underlays provide a barrier which;

- Prevents the ingress of wind-blown rain, dust and snow.
- Minimises the wind load generated under wind gusts acting on slates and tiles

when installed in accordance with this Certificate.
- Offers superior resistance to tearing during installation.
- Remains flexible at low ambient temperatures.
- Facilitates the control of harmful surface and interstitial condensation in the roof by allowing the safe dispersal of water vapour, when installed in accordance with this Certificate.
- Reduces heat loss caused by air movement through the attic space once installed with no ventilation.

In the opinion of NSAI Agrément, the PHS Underlays, as described in this Certificate, complies with the requirements of the Building Regulations 1997 to 2024, hereafter referred to as the Building Regulations in this Certificate.

MANUFACTURE & MARKETING:

The products are manufactured on behalf of and marketed by:

NZEB Products Ltd T/A

Passive House Systems (PHS)

Unit 5B4, Link Road Business Park

Ballincollig Co. Cork

P31 W950

T: 021 487 5297

W: www.passivehousesystems.ie

E: orders@passivehousesystems.ie

1.0 ASSESSMENT:
In the opinion of the NSAI Agrément, PHS Underlays, if used in accordance with this Certificate can meet the requirements of the Building Regulations as indicated in Section 1.1 of this NSAI Agrément Certificate.

Guidance has been adopted from the European Assessment Document or EAD 030218-01-0402[(1)], and I.S. EN 13859-1:2014[(2)].

1.1 BUILDING REGULATIONS:

REQUIREMENTS:

Part D – Materials and Workmanship
D1 – The PHS Underlays as certified in this Certificate, meet the requirements of the Building Regulations for workmanship.

D3 – The PHS Underlays as certified in this Certificate, comprise of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

Part A – Structure
A1 – Loading

Part B – Fire Safety
B4 & B9 – External Fire Spread

Part C – Site Preparation and Resistance to Moisture
C4 – Resistance to Weather and Ground Moisture

Part F – Ventilation
F2 – Condensation in Roofs

Part J – Heat Producing Appliance
J3 – Protection of Building

Part L – Conservation of Fuel and Energy
L1 – Conservation of Fuel and Energy

2.0 PRODUCT DESCRIPTION:

PHS Underlays are watertight, vapour permeable, flexible membranes intended for use as underlays beneath slates or tiles on not fully supported or supported pitched roofs, constructed in accordance with SR 82:2017[3]. The underlays are also available with an integral adhesive tape to ensure an effective seal is achieved at overlaps and penetrations.

Table 1: Nominal Values[i]

	PHS 120	PHS 140	PHS 160	PHS 180	PHS 210
Colour (Top)	Beige	Green	Blue	Burgundy	Black
Roll Width	1.5m	1.5m	1.5m	1.5m	1.5m
Roll Length	50m	50m	50m	50m	50m
Roll Weight	9.0kg	10.5kg	12.0kg	13.5kg	15.75Kg
Mass per unit area	120g/m^2	140g/m^2	160g/m^2	180g/m^2	210g/m^2
Thickness	0.58mm	0.60mm	0.60mm	0.73mm	0.73mm
Reaction to Fire (Class)	E	E	F	E	E
Tensile Strength (N/50mm) • **Longitudinal** • **Traverse**	 217 155	 286 194	 334 219	 384 222	 382 239
Elongation: (%) • **Longitudinal** • **Traverse**	 94 120	 122 133	 137 145	 106 117	 70 84
Tear Resistance: (N) • **Longitudinal** • **Traverse**	 126 162	 155 201	 171 246	 197 259	 243 326
Watertightness: • **Unaged** • **Aged**	 W1 W1	 W1 W1	 W1 W1	 W1 W1	 W1 W1
Water Vapour Transmission (sd)	0.017	0.017	0.019	0.023	0.020
Flexibility at low temperature	-40°C	-40°C	-40°C	-40°C	-40°C

Note(s):

[i] The values stated are based on test data, technical assessments and investigations undertaken as part of the Agrément assessment. These values are nominal and shall not be interpreted as the values declared in the Declaration of Performance (DoP). The DoP values may be obtained directly from the Certificate holder.

2.1 MANUFACTURE:

PHS Underlays are manufactured (in accordance with the harmonised European Standard EN 13859-1[2]) from two UV (Ultraviolet) stabilized spunbonded nonwoven polypropylene layers, thermally bonded to a breathable polypropylene central film. The name of the product is printed on the membrane upper face before being rolled on a spindle, cut to length, wrapped and labelled.

2.1.1 Quality Control:

Quality control checks are carried out during production and on the finished product. These checks include visual inspection, checks on roll and membrane weights, dimensions, tensile strength, elongation, tear resistance, and water penetration resistance (hydrostatic head) etc.

The NSAI has assessed and agreed the following with respect to the quality control of the waterproofing membrane:

The quality control procedures and product testing to be undertaken have been agreed, documented and implemented within the Certificate holder and manufacturer's quality management system. The management system of PHS has been assessed and registered as meeting the requirements of IS EN ISO 9001:2015[4].

- The quality control procedures implemented for batches of incoming materials have been assessed and agreed.
- The production process has been audited and verified to be in accordance with the documented process.
- The investigative procedures and management of non-conformities have been evaluated for effectiveness.
- The Quality Control checks shall be in accordance with the Quality Control Plan (Rev.15.01.26)[5]. The Factory Production Control system shall be implemented in accordance with Section 5 & 6 of the Quality Control Plan (Rev.15.01.26)[5]. As part of these checks, the essential characteristics will be reviewed against those indicated within the Declaration of Performance (DoP).
- The above measures are verified on a regular basis through a surveillance process.

2.2 DELIVERY, STORAGE AND MARKING:
The PHS Underlays are supplied in 50m roll lengths, wrapped in polyethylene film with a label bearing the company name, product name, grade identification and dimensions. Rolls can be stored horizontally on a clean flat level surface and must be kept under cover to protect from long-term exposure to UV light. Care must be taken to avoid contact with solvents and with materials containing volatile organic components. Reasonable precautions must be taken in handling the rolls to prevent damage, such as tears or perforations, occurring before and during installation, and prior to the application of the roof covering.

The rolls must not be exposed to a naked flame or other ignition sources.

2.3 INSTALLATION:
2.3.1 General:
The PHS Underlays must be installed and fixed in accordance with this Certificate, the Certificate holder's instructions, (a copy of which should accompany each roll), and the recommendations of SR 82:2017[3] and BS 5534:2014+A2:2018[6].

2.3.2 Installation Procedure:
Installation of the PHS Underlays can be carried out in all conditions normal to pitched roofing work. In roof construction it is important to remember that the underlay is the second line of defence in excluding water penetrating the roof. For this reason, the following list of criteria must be met to comply with the requirements of this Certificate.

- At the eaves, the use of an Eaves Carrier, i.e. type 5U felt, to meet the specifications of IS EN 13707:2013[7] must be used. This felt should be laid typically with an overlap in accordance with Table 2 and dressed 50mm into the gutter. In an open eaves construction, the use of eaves guards is recommended. The provision of a tilting fillet, continuous ply support, or proprietary eaves ventilation tray is also required to avoid water being trapped behind the fascia board.
- Installation commences by unrolling the underlay horizontally across the rafters, starting at the eaves and working towards the ridges of the roof. The upper (as installed) surface is marked with the product name, and the unmarked surface (coloured white) should face the rafters on unrolling.
- When used not fully supported, each horizontal run must be installed with a minimum drape of 10mm to 15mm between rafters at 600mm centres (in accordance with Clause 6.4.1 of SR 82[3]) to permit free drainage of water into the gutter.
- When tacking roof underlay to the rafters it is recommended that a 3mm diameter x 20mm long extra-large head clout/felt nails of copper, aluminium alloy or galvanised steel be used. The underlay should be tacked at the head of the sheet only, at centres not exceeding 1200mm. It is important that all tacking nails be covered by the overlap of the next underlay course.
- Overlaps of the underlay should be provided in accordance with the minimum dimensions given in Table 2, which are taken from Table 7 of SR 82:2017[3].

Table 2: Minimum Overlaps			
Roof Pitch	**Min. horizontal lap**		**Vertical lap**
	Not Fully Supported	**Fully Supported**	
≥35°	100 mm	75 mm	100 mm
15° to 34°	150 mm	100 mm	100 mm
12.5° to 14°	225 mm	150 mm	100 mm

- Where underlay overlaps do not coincide with a batten, consideration should be given to either including an extra batten at the overlap or increasing the underlay overlap to coincide with the next batten.

- Batten gauges should not exceed that recommended by the tile/slate manufacturer for the tile/slate being used. Moisture content of battens at time of fixing should not exceed 22%.

- Batten sizes shall be in accordance with Clause 5.9.2 and Table 8 of SR 82[3].

- Where timbers on roofs are to be treated with wood preservative, the Certificate holder's guidance be sought in relation to possible chemical attack on the roofing underlay.

- The PHS Underlays have adequate resistance to tearing but are not designed to withstand the weight of operatives or tiles being loaded out. Battens must therefore be installed as work progresses from eaves to ridge to provide secure footing and avoid damage to the underlay surface. No materials or implements should be rested on the underlay. Where pressure on the underlay over a rafter is unavoidable, it should be noted that although the membrane has a high coefficient of friction when dry, it does not offer substantial grip, particularly at overlaps or when wet.

- Where the underlay has become damaged for whatever reason, the damaged area should be overlaid with an additional layer of material ensuring a 150mm overlap all around the damaged section. Ensure that the upslope side is overlapped by the next higher horizontal run of underlay and secured under a batten.

- Standard methods of workmanship should be used to apply the PHS Underlays at penetrations and abutments. It must be ensured that the underlay is turned up at least 50mm at all abutments to be overlapped by the flashings, and that it overlaps the lining tray by at least 100mm at the back face of any abutment.

- Penetrations by soil and vent pipes etc. must be dealt with as follows. The underlay must be star-cut carefully to prevent tears, closely fitted over the pipe, ensuring that all the tabs project upwards along the pipe, and then the tabs taped around the circumference using Argo Plus (multi-tape). A proprietary collar must be fitted over the pipe to protect the tape.

- Courses of underlay over a hip should be overlapped by at least 150mm. Each course should overlap the underlay course(s) on the adjacent elevation of the roof.

- Where hips and valleys occur on roofs, lay an additional strip of underlay at least 600mm wide, running continually from eaves to hip. In valleys, the 600mm wide strip of membrane must be laid over the gutter bed, but under the main roof underlay, and held down by valley battens when used. The main roof underlay must be dressed over the valley battens in this case.

- For duo pitch roofs not requiring ridge ventilation, underlay from each side of the ridge should overlap the other side by at least 225mm. For mono pitch roofs not requiring ridge ventilation, the underlay should extend over the mono ridge and the top facia board by at least 100mm. Where proprietary ventilating ridge systems are specified, detailing of the underlay should be in accordance with the Certificate holder's recommendations.

- When used in a warm roof design, a PHS vapour control to IS EN 13984[23] membrane and associated peripheral tapes and sealants should be installed on the warm side of the insulation. The roof should be counter battened to allow at least 50mm unobstructed air path between the membrane and the tiles. See figure 2.

- Reference should be made to BS 5250:2021[8] for counter batten and ventilation requirements on tiled and slated roofs. Counter battens should be

used when the membrane is to be fully supported (e.g. warm roofs or roofs using a sarking board). This will allow any moisture accessing the main system to drain away unhindered.

- In addition to the use of counter battens, when close-fitting man-made slates that constitute an impermeable external covering are being used, ventilation should be provided above the membrane in the form of ridge tile and eaves ventilation. Reference should be made to BS 5250:2021[8]; in case of doubt, the Certificate holder's advice should be sought.

- Once the selected PHS Underlays is installed, it should be covered by the finished roof covering as soon as practicable, to minimise the effects of long-term exposure to UV light.

- The PHS Underlays as detailed in this Certificate are not suitable for use in flat roof construction and have not been assessed for this use, which is outside the scope of this Certificate.

- When used in a cold roof design that is not ventilated, and where the insulation is laid on top of the ceiling, it is essential that a vapour control layer to IS EN 13984[23] be used on the warm side of the insulation, and that all perforations for pipes, electrical cables, etc. be sealed. The vapour control layer[23] should be turned up around the edge of the insulation and sealed to the walls and soffit to inhibit warm humid air entering the attic.

Other appropriate measures include:

- Ventilating the dwelling below for the dispersal and rapid dilution of water vapour, particularly in rooms that may experience high humidity (such as kitchens, utility rooms and bathroom).

- Covering and insulating all water tanks in the loft space and lagging pipe work.

- Sealing penetrations in the ceiling and making loft hatches convection-tight by using a compressible draught seal.

- Ensuring that there is continuity of joining with walls (and behind wall linings) at sealing perimeters.
- Ensuring that the masonry wall cavities do not interconnect with roof cavities.

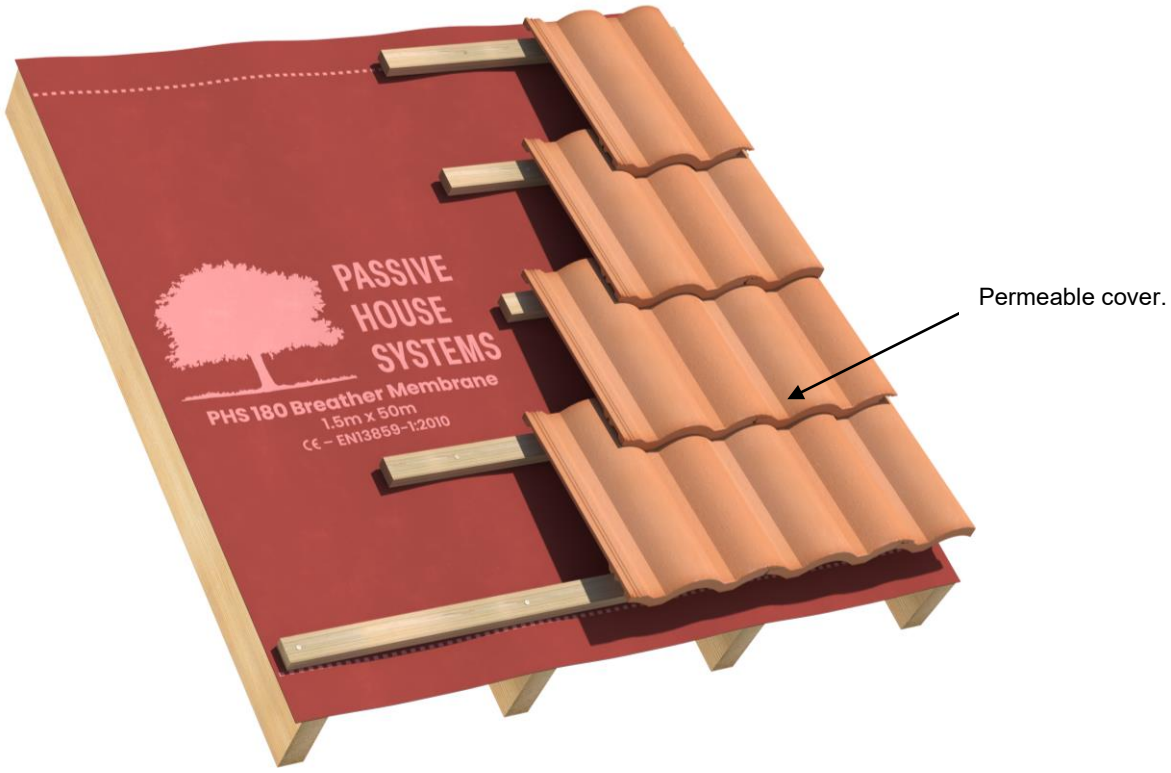


Figure 1: Cold Roof detail with permeable roof covering.

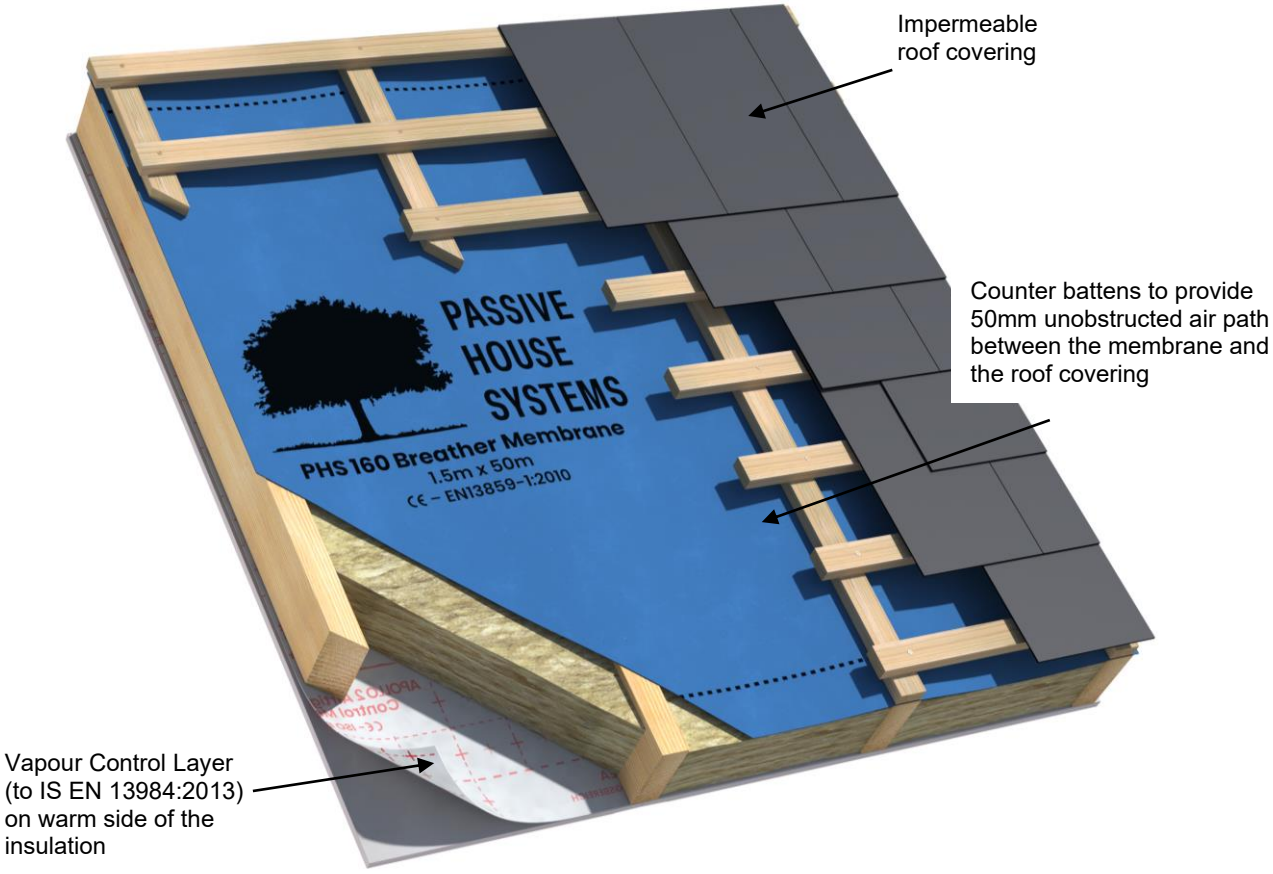


Figure 2: Warm roof detail with impermeable roof cover.



Figure 3: Cold Roof detail with impermeable roof, Ridge detail.

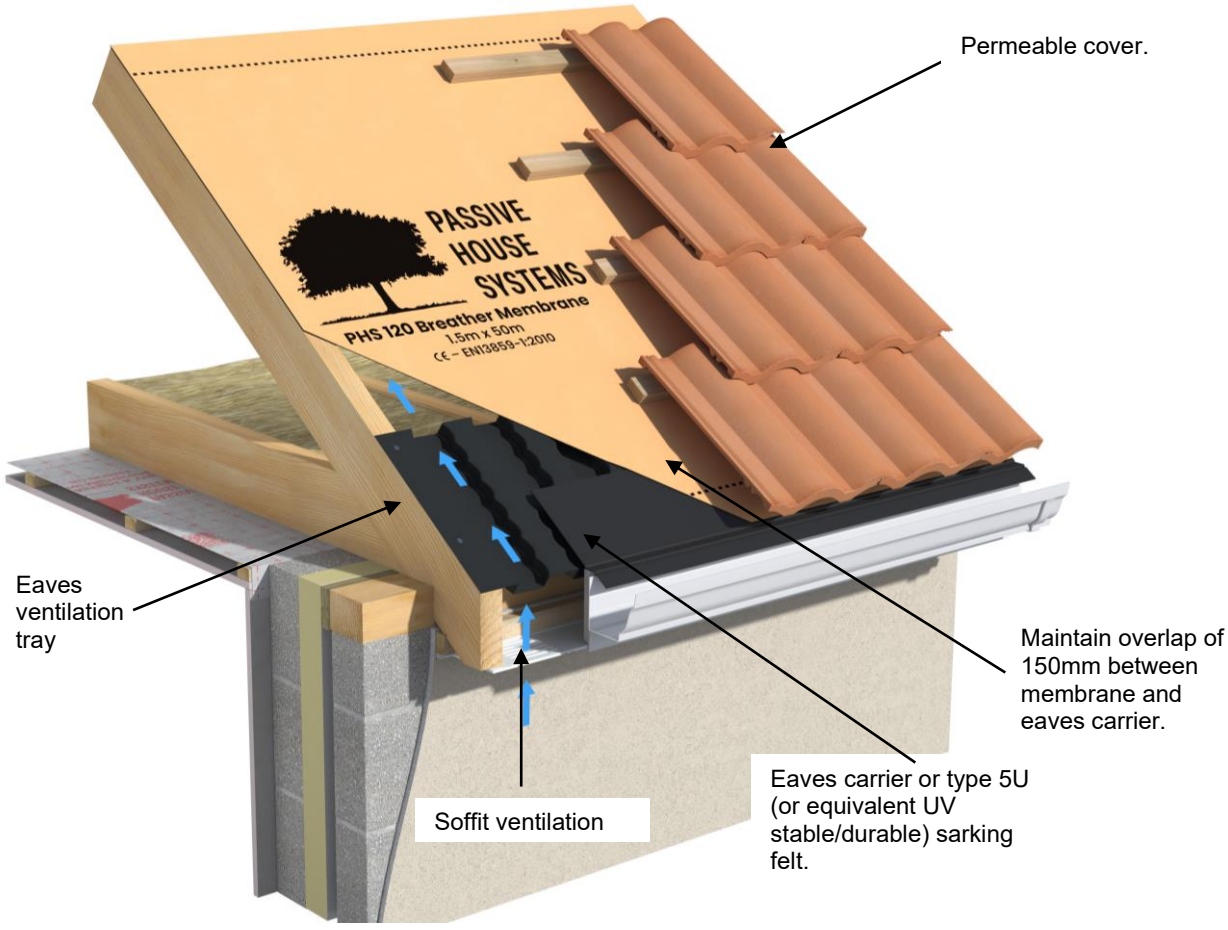


Figure 4: Cold roof detail with permeable roof cover -eaves detail.

3.0 GENERAL:
The PHS Underlays can provide a satisfactory underlay in slated and tiled pitched roofs, constructed in accordance with SR 82:2017[3] and BS 5250:2021[8]. The workmanship requirements shall be in accordance with BS 8000-6:2023[9].

3.1.1 Not fully supported:
The PHS Underlays are satisfactory for use on not fully supported systems as described in Table 2 of this Certificate (see also Figure 4). The classifications shown in Table 4 are based on the simplified approach for obtaining design wind pressure and required uplift resistance as defined in BS 5534:2014+A2:2018[6]. These details are valid where a well-sealed ceiling is present and the roof has a ridge height ≤15m, a pitch between 12.5° and 75°, and a site altitude ≤100m where the topography is not significant.

When building and site conditions are outside these limitations, the design wind pressure p_u should be calculated in accordance with Equation H.13 of BS 5534:2014+A2:2018[6] in order to determine the required wind uplift resistance. Calculated values can then be compared to the wind uplift resistances in Tables 3 and 4 of this Certificate in order to select a suitable roof underlay and batten spacing.

Per Equation H.13 of BS 5534:2014+A2:2018[6], the design wind pressure $p_u = f_u \times q_p$, where:

f_u = 0.75 when a well-sealed ceiling is present;

F_u = 0.90 when no ceiling or no well-sealed ceiling is present;

f_u = 1.10 when no ceiling or no well-sealed ceiling is present on a permanent dominant opening on an external face of the building;

q_p = is the peak velocity pressure from IS EN 1991-1-4:2005 AMD 1:2010[10].

See BS 5534:2014+A2:2018[6] Cl H.6 for all other considerations.

3.1.2 Supported:
Tables 3 and 4 show wind uplift resistance test results to BS 5534:2014+A2:2018[6] and suitability for use in Irish conditions.

The products may be used at any batten gauge in all wind zones when laid over nominally air-tight sheet sarking, for example OSB board, plywood and insulation for warm-roof designs. They can also be used when slates and tiles are nailed directly into the sarking board.

Poorly fitted sarking boards such as square-edged butt-joints are not considered to be airtight and as a result the underlay should be treated as not fully supported in those situations.

3.2 WEATHERTIGHTNESS:
Tests confirm that PHS Underlays will resist the passage of water, wind-blown snow and dust into the interior of a building under all conditions to be found in a roof constructed to SR 82:2017[3], BS 5534:2014+A2:2018[6], and BS 8000-6:2023[9].

The PHS Underlays have been classified as having a resistance to water penetration of Class W1 in accordance with IS EN 13859-1:2014 *g*[2]. A Class W1 is the highest resistance to water penetration classification described in the standard.

The underlays may be used to provide temporary (it should be covered by the finished roof covering as soon as practicable) waterproofing to the structure of the building prior to the installation of slates or tiles. It is however recommended that this period of time be kept to a minimum in accordance with PHS Installation Guide (See Cl 2.3.2).

3.3 VENTILATION / CONDENSATION:
For design purposes the water vapour transmission (s_d value) is given in Table 1 of this Certificate. When this value for each membrane is divided by the vapour permeability of still air (0.2gm/MNs) this will give the vapour resistance of each membrane. When the value is greater than 0.25MNs/g, an underlay may be regarded as a Type HR membrane for roofs designed in accordance with BS 5534:2014+A2:2018[6] and BS 5250:2021[8].

In pitched roofs where the insulation follows the line of the pitch (as in dormer roof construction), ventilation must be provided above the insulation. This ventilation gap can be above or below the underlays. For all roof coverings, a continuous unobstructed ventilation gap of at least 50mm should be provided in the space between the underlay and the insulation, (as

shown in Diagram 11 of TGD Part F[11]), in these circumstances it will be necessary to install a vapour control layer[23] on the warm side of the insulation.
Alternatively, a ventilation space above the underlay and under the roof covering. Ventilation of the space above the insulation may not be required provided that the roof coverings are air permeable.

The general principle when designing a roof system that can successfully manage moisture, whether the source of the moisture is from the external environment or if the source arises internally from occupants, bathrooms, cooking etc, is that the most vapour tight layer is located on the inside of the roof structure and all subsequent outer layers become increasingly vapour permeable as we move towards the roof coverings.

In pitched roofs where the insulation follows the line of the ceiling, attic ventilation must be provided in accordance with TGD Part F [11]. The optimum size and disposition of vents should be determined by the size and shape of the loft; large and/or complex roofs may require vents at both high and low levels. Further design guidance can be found in BS 5250:2021[15].

A vapour control layer[23] should be installed on the warm side of the insulation unless a hygrothermal analysis to IS EN ISO 13788:2012[12] or IS EN 15026:2023[13] deems it to be unnecessary.

It is essential that roofs be constructed so as to prevent moisture penetration and the formation of condensation. In accordance with good building construction practice, all openings for services and trap doors should be draught sealed, and trap doors should not be located in bathrooms, shower rooms or kitchens.

The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading owing to wet trades such as cast concrete slabs or plaster. Additional ventilation should be provided during this period, including the opening of doors and windows. The risk diminishes as the building dries out naturally.

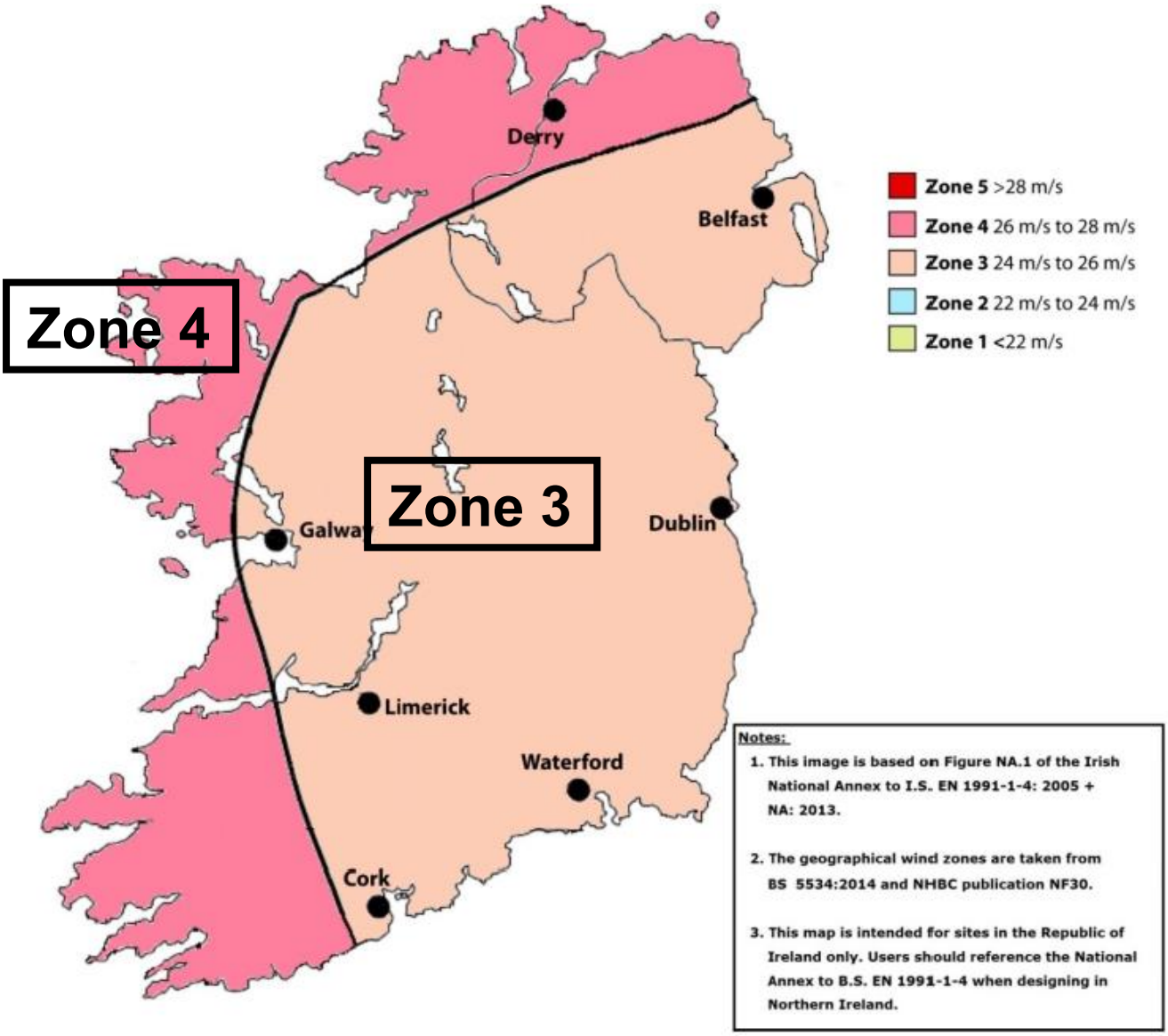


Figure 5. Irish windmap

4.0 BEHAVIOUR IN FIRE:
PHS Underlays have similar properties in relation to fire as those of polythene sheets and so will present no additional fire hazard to a roof structure in which it is incorporated, in comparison with conventional roof tile underlays.

All PHS Underlays were tested and classified in accordance with I.S. EN 13501-1:2018[14], Table 1. Tests indicate that there is a risk of fire spread if accidentally ignited during maintenance works, etc. (e.g. by a roofer's or plumber's torch). As with all types of sarking material, care must be taken during building and maintenance to avoid the material becoming ignited. Class E indicates a product which satisfies the requirement that no surface spread of flame exceeds 150mm when tested in accordance with I.S. EN ISO 11925-2:2021[15], and Class F indicates that no performance criteria are declared.

When the products are used in a fully supported situation, the reaction to fire will be determined by the supporting deck. The PHS Underlays, being combustible materials, must be separated from chimneys and flues as indicated in Cl 2.5.6, CL 3.82 and Cl 3.11.1 of TGD to Part J[16] of the Building Regulations.

If a fire does occur, the contribution of toxic gas attributed to the membrane is negligible.

4.1 WATER PENETRATION:
The PHS Underlays, when used in accordance with this Certificate, present no significant risk of water penetration.

4.2 DURABILITY AND MAINTENANCE:
The PHS Underlays when installed in accordance with this Certificate, the Certificate holder's instructions and relevant codes of practice, are virtually unaffected by conditions normally found in a roof space and will have a design life comparable with that of traditional roof tile underlays, provided that they are not exposed to sunlight for long periods during the installation phase. Upon installation of the PHS underlays, they shall be covered with the primary roofing finish as soon as possible to avoid any premature failure from inclement weather and/or UV exposure. The durability of the roof underlay will be dependent on the performance of the roof covering (slates/tiles), and this could be compromised if the roof is not routinely maintained or is subjected to inappropriate traffic.

Such maintenance would involve building owners having their roofs inspected annually, preferably in late autumn. Inspection should include checking for missing, damaged or loose slates/tiles and their accessories or flashings. Clogged gutters or downpipes should be unblocked and cleaned.

Should the membrane be damaged during its installation, it shall be repaired in accordance with the procedure as outlined in the "PHS Breather Membrane Repair Procedure" [16].

4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK:
PHS Underlays have significantly higher water vapour permeability than that quoted as a minimum for conventional roof tile underlays in BS 5534:2014+A2:2018[6], and hence movement of moisture vapour can take place through the underlay. The general design guidance contained in BS 5250:2021[8] is met when installing this product. Nominal values of water vapour transmission are given in Table 1.

The PHS Underlays can be treated as vapour permeable underlays when considering the ventilation requirements of the roof.

4.4 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:
Tables 1, 3 & 5 give a summary of the technical investigations carried out on the PHS range of underlays.

4.5 OTHER INVESTIGATIONS:
(i) Existing data on product properties in relation to, mechanical strength/stability, environmental impact and durability were assessed.

(ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

(iii) Site visit was conducted to assess the practicability of installation and the history of performance in use of the product.

(iv) Further testing was performed in accordance with the requirements of EOTA EAD 030218-01-0402[1]. The results of these tests are contained in Table 5.

(v) A condensation risk assessment was performed on multiple roof build-up types, and no risk was identified as a result of using these products.

4.6 CE MARKING:

The Certificate holder has taken responsibility for CE marking the PHS range of underlays in accordance with harmonised European Standard EN 13859-1:2014[2].

Reference should be made to the latest version of the DoP for current information on any essential characteristics declared by the Certificate holder.

Table 3: Test results for wind uplift resistance to BS 5534:2014+A2:2018[6]

Product	Wind Uplift Pressure[ii]		
	345mm Batten Gauge (Untaped) Battened Lap	250mm Batten Gauge (Untaped)[i] Battened Lap	345mm Batten Gauge (Taped) With Taped Laps
PHS 120g Breather	664.5 kPa	1638.8 kPa	1476.6 kPa
PHS 140g Breather	822 kPa	1929.7 kPa	1596.7 kPa
PHS 160g Breather	1029.5 kPa	2297.0 kPa	1863.6 kPa
PHS 180g Breather	1030.6 kPa	2260.1 kPa	1892.6 kPa
PHS 210g Breather	1456.5 kPa	3058.6 kPa	2503.8 kPa

Note(s):

[ii] Underlays with a wind uplift resistance at a 250mm batten gauge that meet the minimum design wind pressure of 820Pa (Zone 1) are deemed to satisfy the requirements for use at 100mm batten gauge in all wind zones (Zones 1 to 5, see Figure 5).

[iii] Mean of test results.

Table 4: Test results for wind uplift resistance to BS 5534:2014+A2:2018[6]

Product	Geographical Wind Zones		
	345mm Batten Gauge (Untaped) Battened Lap	250mm Batten Gauge (Untaped)[i] Battened Lap	345mm Batten Gauge (Taped) With Taped Laps
PHS 120g Breather	Not suitable for use in Irish conditions	Zones 3 and 4[iii]	Zones 3 and 4[iii]
PHS 140g Breather	Not suitable for use in Irish conditions	Zones 3 and 4[iii]	Zones 3 and 4[iii]
PHS 160g Breather	Not suitable for use in Irish conditions	Zones 3 and 4[iii]	Zones 3 and 4[iii]
PHS 180g Breather	Not suitable for use in Irish conditions	Zones 3 and 4[iii]	Zones 3 and 4[iii]
PHS 210g Breather	Zones 3 and 4[iii]	Zones 3 and 4[iii]	Zones 3 and 4[iii]

Note(s):

[i] The above classifications are valid where:

a. A well-sealed ceiling is present;
b. The roof has a ridge height ≤15m;
c. A pitch between 12.5° to 70°;
d. A site altitude ≤100m;
e. Where topography is not significant. (gradient ≤5%).

[ii] When outside the limitations of Note [i] above, the design wind pressure, p_u, should be calculated in accordance with BS 5534:2014+A2:2018 [6] (Equation H.13) in order to determine the required wind uplift resistance. Calculated values can then be compared to wind uplift resistances published above in order to select a suitable roof underlay and batten spacing.

[iii] Only zones 3 and 4 exist in Ireland. See Figure 5 for details.

Table 5: EOTA (EAD 030218-01-0402[1]) Further testing results table.					
Product	**120gsm**	**140gsm**	**160gsm**	**180gsm**	**210gsm**
Hailstone Test damage Rate Vd (m/s) EN 13583:2012[17]	50	50	50	50	>50
Air Permeability ($m^3/h \times m^2 \times 50Pa$) EN 12114:2000[18]	0.027	0.029	0.026	0.034	0.028
Water Column Resistance (mm) EN 1928:2000 [19]	4200	5400	3000	4700	4700
Watertightness of Seams. EN 1928:2000 [19]	Pass	Pass	Pass	Pass	Pass
Dimensional Stability. EN 1107-2:2002[20] Longitudinal (%) Transverse (%)	-6.42 -0.48	-4.81 -0.20	-1.89 +0.50	-1.74 +0.36	-1.89 +0.70
Emissivity (ε_n) ASTM-E408)[21]	0.843	0.803	0.804	0.829	0.928
Water Tightness of Nail Perforations[i]	Pass	Pass	Pass	Pass	Pass

Note(s):

[i] ***(Laboratory wind-driven rain test)***
Roof Pitch =14°
Rain Spray (2 L/m²xmin)
Wind Pressure ≤ 600 Pa

5.0 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the Certificate holders' installation guides and usual trade practice. This Certificate shall remain valid for five years from date of issue or revision date so long as;

a) the specification of the product is unchanged.

b) the Building Regulations and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.

c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.

d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.

e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this Certificate.

f) the registration and/or surveillance fees due to NSAI are paid.

5.1 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.2 In granting Certification, the NSAI makes no representation as to;

a) the absence or presence of patent rights subsisting in the product/process; or

b) the legal right of the Certificate holder to market, install or maintain the product/process; or

c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.3 This Certificate does not comprise installation instructions and does not replace the Certificate holders' directions or any professional or trade advice relating to use and installation which may be appropriate.

5.4 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However, the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005[22], or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.5 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

5.6 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, Certificate holders installation guides, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

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This Certificate No. **26/0457** is accordingly granted by the NSAI to **NZEB Products Ltd t/a Passive House Systems** on behalf of NSAI Agrément.

Date of Issue: **16TH October 2026**

Signed



Kevin D. Mullaney
Director of Certification, NSAI

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.nsai.ie

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