Bord Agrément na hÉireann
Irish Agrément Board

CERTIFICATE NO. 02/0138

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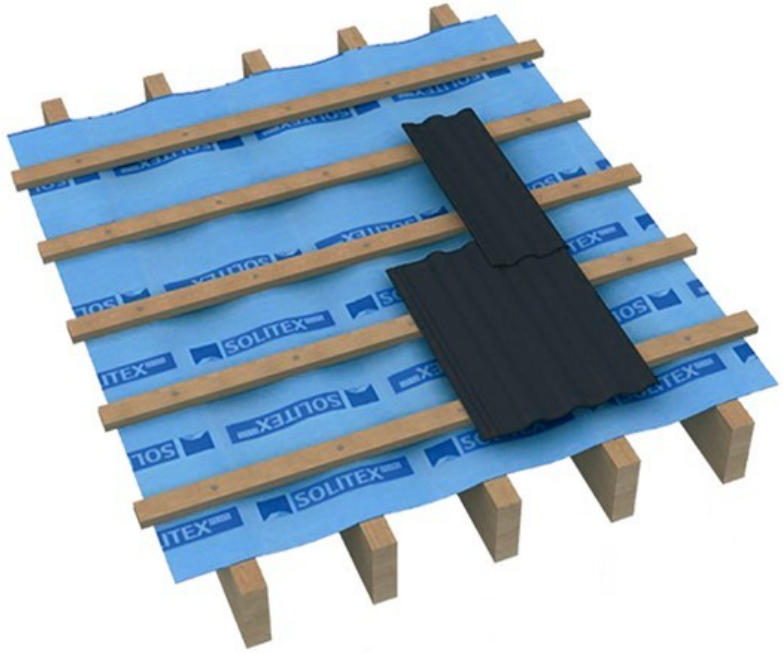
Solitex Plus & Solitex UD Vapour Permeable Roofing Underlays for Pitched Roofs

Revétement D'étanchéité
Dachabdichtungen

The **Irish Agrément Board** is designated by Government to issue European Technical Approvals.

Irish Agrément Board 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 2006**.

The **Irish Agrément Board** operates in association with the **National Standards Authority of Ireland (NSAI)** as the National Member of UEAtc.



PRODUCT DESCRIPTION:
This Certificate relates to Solitex UD and Solitex Plus roof tile underlays made from a spunbonded polypropylene fabric designed for use as unsupported and supported roofing underlays for warm ventilated and non-ventilated and cold ventilated and non-ventilated tiled or slated pitched roofs.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2006.

USE:
This Certificate relates to the use of Solitex Plus and Solitex UD on either fully supported or unsupported ventilated and non-ventilated pitched roofs. Solitex UD roof tile underlay prevents the ingress of windblown rain, dust and snow, while Solitex Plus also provides a barrier to minimise the effects of wind load generated under wind gusts acting on slates and tiles when installed in accordance with this Certificate. Solitex Plus and Solitex UD also facilitate the control of surface and interstitial condensation in insulated roofs. Solitex Plus roof tile underlay offers resistance to tearing during installation and will give higher flexibility at low ambient temperatures.

MANUFACTURE & MARKETING:
These products are manufactured on behalf of:

Moll Bauökologische Produkte GmbH,
Pro Clima,
Schwetzingen,
Germany

These products are marketed by:

MacCann & Byrne Ltd.,
Importers and Distributors,
Athboy,
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1.1 ASSESSMENT
In the opinion of the Irish Agrément Board (IAB), Solitex Plus and Solitex UD roof tile underlays, if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2006, as indicated in Section 1.2 of this Irish Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2006

REQUIREMENT:

Part D – Materials and Workmanship
D3 – Solitex Plus and Solitex UD roof tile underlays, as certified in this Certificate, are comprised of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

D1 – Solitex Plus and Solitex UD roof tile underlays, as certified in this Certificate, meet the requirements of the building regulations for workmanship.

Part A - Structure
A1 – Loading
Tests indicate that roofs incorporating Solitex Plus and Solitex UD roof tile underlays meet the requirements provided the installations comply with the conditions set out in Section 2.4 and Part 3 of this Certificate.

Part B – Fire Safety
B4 – External Fire Spread
Solitex Plus and Solitex UD roof tile underlays will not prejudice the external fire resistance of the roof, as indicated in Section 4.1 of this Certificate.

Part C – Site Preparation and Resistance to Moisture
C4 – Resistance to Weather and Ground Moisture
Solitex Plus and Solitex UD roof tile underlays meet the requirements when installed as indicated in Section 2.4 of this Certificate.

Part F – Ventilation
F2 – Condensation in Roofs
Solitex Plus and Solitex UD roof tile underlays will provide water vapour resistance significantly less than that quoted as a maximum for conventional roof tile underlays in BS 5534-1:2003 *Code of practice for slating and tiling – Design,* and hence, movement of moisture vapour can take place through the underlays.

In a non-ventilated roof system where Solitex Plus and Solitex UD are installed in accordance with this Certificate and the manufacturer's instructions, the underlays can prevent excessive condensation in a roof or in a roof void above an insulated ceiling as required by Part F of the Building Regulations 1997 to 2006.

Where Solitex Plus and Solitex UD roof tile underlays are installed with ventilation, the design guidelines contained in Section 2 of the TGD to Part F of the Building Regulations 1997 to 2006 and BS 5250:2002 *Code of practice for control of condensation in buildings*, Section 8.4.2, must be met when installing this product.

Solitex Plus and Solitex UD can be treated as vapour permeable underlays when considering the ventilation requirements of the roof.

Part L – Conservation of Fuel and Energy
L1 – Conservation of Fuel and Energy
Based on the measured vapour resistance of Solitex Plus and Solitex UD roof tile underlays, roofs incorporating insulation can meet the requirements of Part L of the Building Regulations 1997 to 2006.

Where Solitex Plus and Solitex UD are installed with ventilation and the ceiling has to be fixed to the soffit of the rafters and insulation to be fitted between the rafters as in dormer roof construction, a continuous ventilation space of at least 50mm should be arranged as shown in Diagram 6D of TGD to Part F of the Building Regulations 1997 to 2006. In these circumstances it will be necessary to install a vapour control layer on the warm side of the insulation.

2.1 PRODUCT DESCRIPTION

Solitex Plus and Solitex UD roof tile underlays are made from spunbonded polypropylene. Solitex UD (without reinforcement) and Solitex Plus are for use under tiles or slates on supported or fully supported ventilated pitched roofs constructed in accordance with ICP 2:2002 *Irish code of practice for slating and tiling*. Solitex Plus and Solitex UD roof tile underlays prevent the ingress of windblown rain, dust and snow when installed in accordance with this Certificate.

The dimensions and weights of the underlays are shown in Table 1.

Product	Weight (g/m^2)	Colour	Length (m)	Width (m)
Solitex UD	140	Blue/Grey	50	1.5
Solitex Plus	170	Blue/Grey	50	1.5

Other roll widths are available on request

Table 1: Dimensions and Weights

2.2 MANUFACTURE

Solitex UD: Roof tile underlay without reinforcement. This underlay may be used draped from rafter to rafter (unsupported) or fully supported with timber sheathing or rigid insulation board, under roofing tiles/slates or metal panels. The manufacturing process involves the bonding together of two polypropylene spunbonded felts with a central layer of monolithic nonporous TEEE (thermoplastic ether ester elastomer) membrane through an extrusion-coating process.

Solitex Plus: Roof tile underlay with PP-net reinforcement. This underlay may be used draped from rafter to rafter (unsupported) or fully supported with timber sheathing or rigid insulation board, under roofing tiles/slates or metal panels. The manufacturing process involves the bonding together of two polypropylene spunbonded felts with a reinforcement net and a central layer of monolithic nonporous TEEE membrane through an extrusion-coating process, using a combination of heat and pressure in a continuous process.

2.2.1 Quality Control

Quality control checks are conducted on the raw materials before and during manufacture and on the finished product. Quality control checks include visual inspection and checks on dimensions (length, width, thickness), tensile strength, tear resistance, roll weight, water vapour permeability and water penetration resistance test.

The product quality manufacturing systems of the company have been assessed and are satisfactory. The company is also registered to ISO 9001:2000.

2.3 DELIVERY, STORAGE AND MARKING

Solitex Plus and Solitex UD roof tile underlays are supplied in 50m rolls. The rolls are then placed on a pallet and shrink wrapped. Each roll is labelled with a paper wrapper, which shows the manufacturer's name, product description and production batch number identifying date and time of batch. The name of the product is also printed on the exposed surface of the material. Every roll shows the IAB identification mark and Certificate number and contains instructions on storage and installation.

Rolls may be stored on end or laid flat and must be kept under cover to protect from UV light. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, and timbers newly treated with creosote.

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

2.4 INSTALLATION

2.4.1 General

Solitex Plus and Solitex UD roof tile underlays must be installed and fixed in accordance with this Certificate, the Certificate holder's instructions, and the relevant recommendations of ICP 2:2002 and BS 5534-1:2003.

2.4.2 General Installation Criteria

Installation of Solitex Plus and Solited UD roof tile underlays can be carried out in all conditions normal to pitched roofing work. In roof construction it is important to remember that Solitex Plus and Solitex UD roof tile underlays are 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:

- Ensure that Solitex Plus and Solitex UD roof tile underlays are correctly installed and not damaged.
- Where Solitex Plus and Solitex UD roof tile underlays become damaged for whatever reason, it is imperative that they are suitably repaired with a new piece of matching material or a pro clima Tescon No. 1 or Budax Top adhesive tape if the damage is minimal.
- During the operation of installing the roofing underslating, it is imperative that persons working on the roof do not use Solitex Plus or Solitex UD roof tile underlays for supporting themselves or the slates/tiles independently of the roof.
- Overlaps of the Solitex Plus and Solitex UD roof tile underlays should be provided in accordance with the minimum dimensions given in Table 2, which are taken from ICP 2:2002.
- Batten gauges should not exceed that recommended by the tile/slate manufacturer for the particular tile/slate being used.
- Moisture content of battens at time of fixing should not exceed 22%.

Roof Pitch	Horizontal lap		Vertical lap
	Partially Supported	Fully Supported	
Pitch<22.5°	225 mm	100 mm	100 mm
22.5°<Pitch<35°	150 mm	100 mm	100 mm
Pitch>35°	100 mm	75 mm	100 mm

Table 2: Minimum Overlaps

- Where 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.
- Where timbers on roofs have been treated with wood preservative due to high moisture content of timbers, it is essential that manufacturer's guidance be sought in relation to chemical attack from preservative on roofing underlay.
- When tacking Solitex Plus and Solitex UD roof tile underlays to the rafters, it is recommended that 3mm diameter x 20mm long extra large head felt nails of copper, aluminium alloy, galvanised steel or galvanised staples of a minimum 10mm width and 8mm depth 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 so that the minimum headlap is maintained between the tacks and the lower edge of the overlapping underlay.
- The application of counter battens significantly reduces the risk associate with water penetration due to water ponding or by capillary action along the nail penetrations.
- Where hips and valleys occur, they should be covered with an additional layer of underlay at least 750mm wide on each side. This additional layer of underlay should run continuously from eaves to ridge.
- At ridge level, Solitex Plus and Solitex UD roof tile underlays should be carried over the ridge with correct detailing for ridge vents if the roof is ventilated, and a minimum overlap of 225mm.
- Where Solitex Plus and Solitex UD roof tile underlays are fully supported on decking, counter battens must be used or where the architect/engineer specifies it to allow a deflection in the underlay to run the water into the gutter.
- Solitex Plus and Solitex UD roof tile underlays are not suitable for use in flat roof construction.
- Solitex Plus and Solitex UD roof tile underlays must be laid horizontally across the roof with the product name facing up.
- Where the length of the rafter slope measured on plan exceeds 6m, Solitex Plus and Solitex UD roof tile underlays should not be used unless the manufacturer's guidance is sought in relation to detailing.

			Results	
	Units	Test Standard	UD	PLUS
Thickness	mm	BS 2782-3:Methods 320A to 320F:1976	0.5 +/- 5%	0.65 +/- 5%
Weight	g/m^2	BS 2782-6:Methods 620A to 620D:1991	140	170
Standard roll weight	kg	BS 2782-6	11	13
Tensile strength	N/50mm	IS EN 12311-1	480 Long 363 Trans	981 Long 761 Trans
Elongation	%	IS EN 12311-1	49 Long 54 Trans	17.5 Long 17.5 Trans
Nail tear resistance	N	IS EN 12310-1	158 Long 179 Trans	302 Long 374 Trans
Dimensional stability	%	IS EN 1107-2	-0.63 Long 0.28 Trans	-1.20 Long -0.20 Trans
Water vapour resistance	MNs/g	IS EN ISO 12572: At 23°C/RH 50/93% At 23°C/RH 75/93% At 2°C/RH 85/95%	 0.19 0.15 0.15	 0.19 0.15 0.15
Resistance to water penetration		IS EN 1928	Class W1	Class W1
Resistance to streaming water		MOAT 69: 4.2.2	Pass	Pass
Resistance to wind loads	kPa	MOAT 69: 4.2.1: Batten spacing 350mm Batten spacing 330mm Batten spacing 300mm Batten spacing 250mm	 0.5 1.0 1.5 2.5	 1.5 2.0 2.5
Mullen burst strength	kN/m^2	BS 3137	541	910
UV stability			6 months	6 months

Table 3: Physical Properties of Solitex UD and Solitex Plus

- When installing Solitex Plus or Solitex UD without counter battens in unsupported roofs, the roof tile underlays should be draped with a deflection of 5-10mm between rafters to permit free drainage of water vapour into the gutter. The deflection must not be so great as to permit contact with the underside of the slating or tiling when the underlay is subject to wind uplift.

- Solitex Plus and Solitex UD may be installed without ventilation, however where ventilation is considered the ventilation requirements should be in accordance with TGD to Part F of the Building Regulations 1997 to 2006. Continuous eaves ventilation should be provided at a minimum rate equivalent to 10mm continuous and ridge ventilation of 5mm per linear meter ref. Fig 1 and 3)

- Where continuous eaves ventilation is provided, the soffit vent should incorporate a fly screen to prevent birds and insects entering the roof void.

- To assist in the ventilation of the eaves in a cold roof, the use of proprietary eaves ventilators is strongly recommended as they ensure that quilt or loose fill insulation will not obstruct the flow of air where the insulation and roof meet (ref. Fig 3).

- When using tile/slate ventilators they should be installed as close to the ridge as possible to increase ventilation circulation.

- Where Solitex Plus and Solitex UD roof tile underlays are used in dormer roof construction, i.e. where the ventilation is along the line of the rafters, it will be necessary to install a vapour control layer on the warm side of the insulation. It is good practice to install a vapour control layer in conjunction with an insulated roof.

- A vapour control layer should be a minimum of 1000 gauge or greater polyethylene, or pro clima INTELLO PLUS with intelligent vapour diffusive properties (humidity variable diffusion resistance), with sealed laps using proprietary pro clima sealing tapes and accessories, or its equivalent.

- When used in non-ventilated cold roof design where the insulation is laid on top of the ceiling, it is essential that a sealed vapour control layer, such as pro clima INTELLO PLUS, be used on the warm side of the insulation, and all perforations for pipes, electrical cables etc. should be sealed using pro clima sealing accessories or equivalent. The vapour control layer 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. This seal can be achieved using either pro clima Orcon F adhesive or Contega PV tape. For further guidance regarding sealing this detail, please refer to the certificate holder.

- Solitex Plus and Solitex UD roof tile underlays, if exposed to UV light on a continuous basis, will degrade; therefore at eaves a waterproof underlay or eaves reinforcement sheet which is resistant to UV light and rot should be used. This felt should be dressed 50mm into the gutter and be provided with a tilting fillet. Where the UV resistant eaves protection sheet is dressed into the gutter, it should allow effective rainwater and water vapour drainage into the gutter but not affect the flow of rainwater in the gutter (ref. Fig 4).

- Once the Solitex Plus or Solitex UD roof tile underlay is installed, it should not be exposed to UV light for more than 6 months as it will degrade.

2.4.3 Installation Criteria for Non-Ventilated Roof Designs in relation to Condensation Risk

Solitex Plus and Solitex UD roof underlays have a significantly lower water vapour resistance than that of conventional roof underlays and therefore do not have to rely upon air movement beneath the underlay to minimise the risk of condensation. However, it is essential that the amount of water vapour generated in the dwelling below is limited. The following measures will help to reduce the build-up of water vapour:

- All penetrations into the roof space must be properly sealed and loft hatches made convection tight by means of a compressible draught seal. Subsequent penetrations can be sealed using pro clima sealing accessories (i.e. pro clima Tescon No. 1 or Uni Tape).

- The dwelling below the roof must be ventilated in accordance with F1 of TGD to Part F of the Building Regulations 1997 to 2006 for the dispersal and rapid dilution of water vapour.

- All water tanks in the loft space must be covered and all pipe work lagged.

- A sealed vapour control layer, such as INTELLO PLUS vapour check or its equivalent, should be installed on the warm side of the insulation in both cold roof and warm roof designs.

- All penetrations, e.g. pipe work, electrical fittings, to the loft space must be sealed using pro clima rubber gaskets, pro clima Tescon No. 1 flexible tape or equivalent.

- There is no requirement for eaves or ridge ventilation with Solitex Plus and Solitex UD, as both roof underlays do not require air movement to avoid damage by condensation.

- In a non-ventilated cold roof, the insulation is laid horizontally on the pro clima INTELLO PLUS vapour check or equivalent at ceiling level and must be pushed into the eaves and against the underlay to ensure that there are no gaps present, as shown in Fig 4. It is important to ensure that a barrier to vapour movement is maintained on the warm side of the insulation over the whole ceiling, particularly at the junction from the ceiling to the external wall.

- In a non-ventilated warm roof, the insulation is installed between the rafters so as to fill the rafter void. It is important to install the pro clima INTELLO PLUS vapour check or equivalent on the warm side of the insulation over the whole roof. All laps,

junctions to proximal components and service penetrations of the pro clima INTELLO PLUS vapour check or equivalent should be sealed using suitable pro clima sealing accessories or equivalent.

- In a non-ventilated warm roof the underlay may be laid taut or draped, parallel to the eaves and fixed by counter battens (minimum thickness 25mm). See Fig 2.

- To increase the wind tightness of the roof, in the case of roofs with a low pitch, or in exposed areas, all overlaps, penetrations and junctions to proximal components of Solitex Plus or Solitex UD may be sealed using pro clima Tescon No.1 or Budax Top adhesive tape or equivalent.

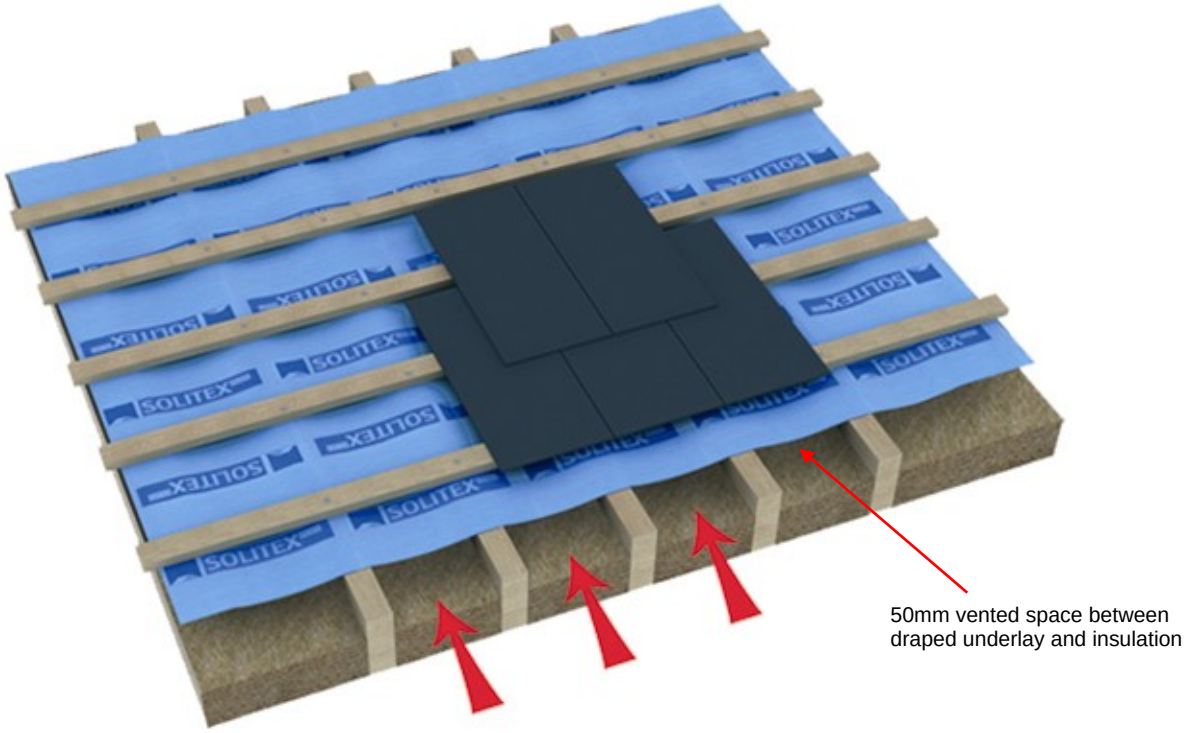


Figure 1: Ventilated warm roof detail

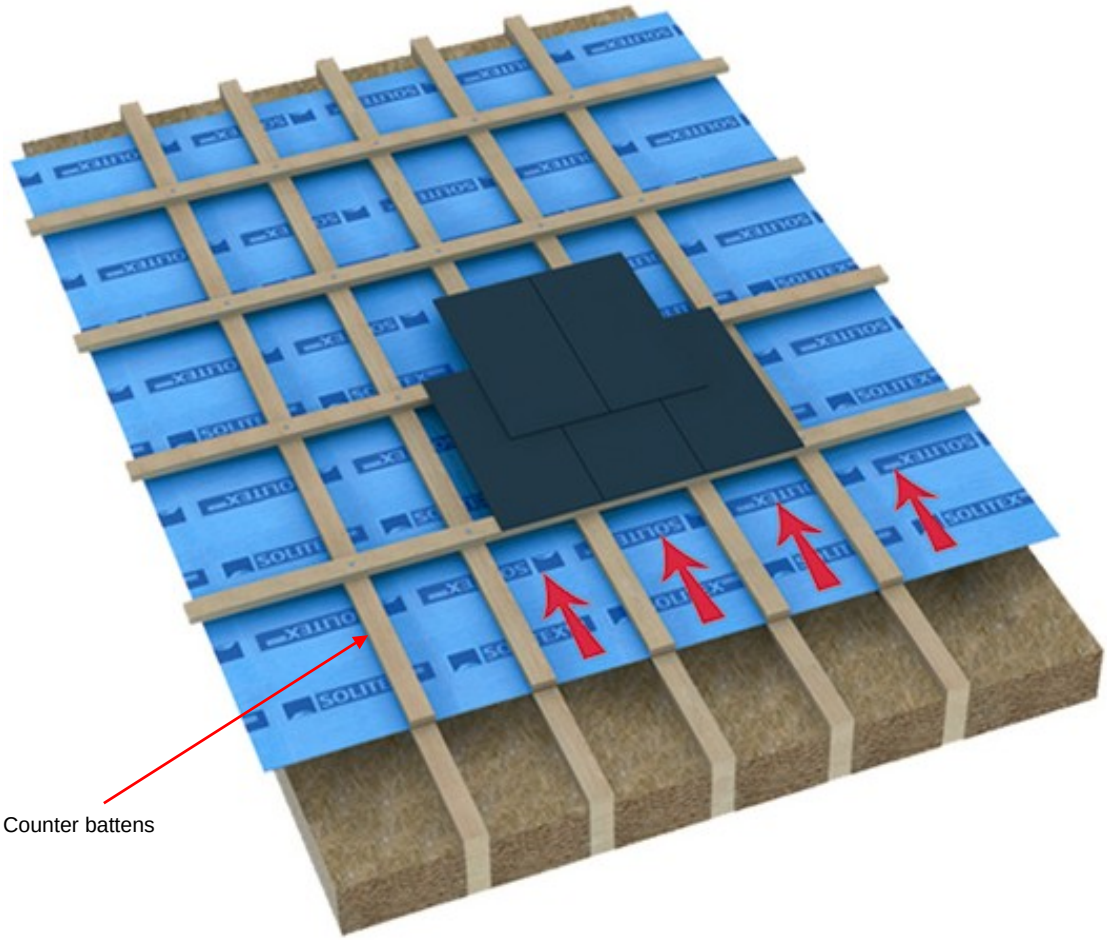


Figure 2: Non ventilated warm roof detail

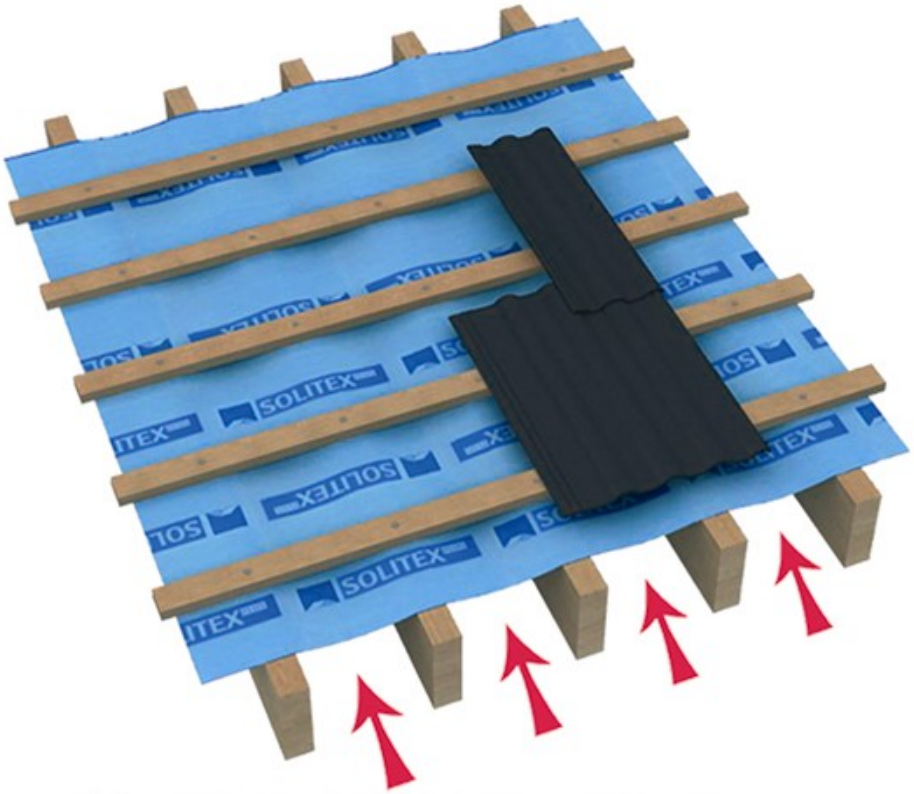


Figure 3: Ventilated cold roof detail

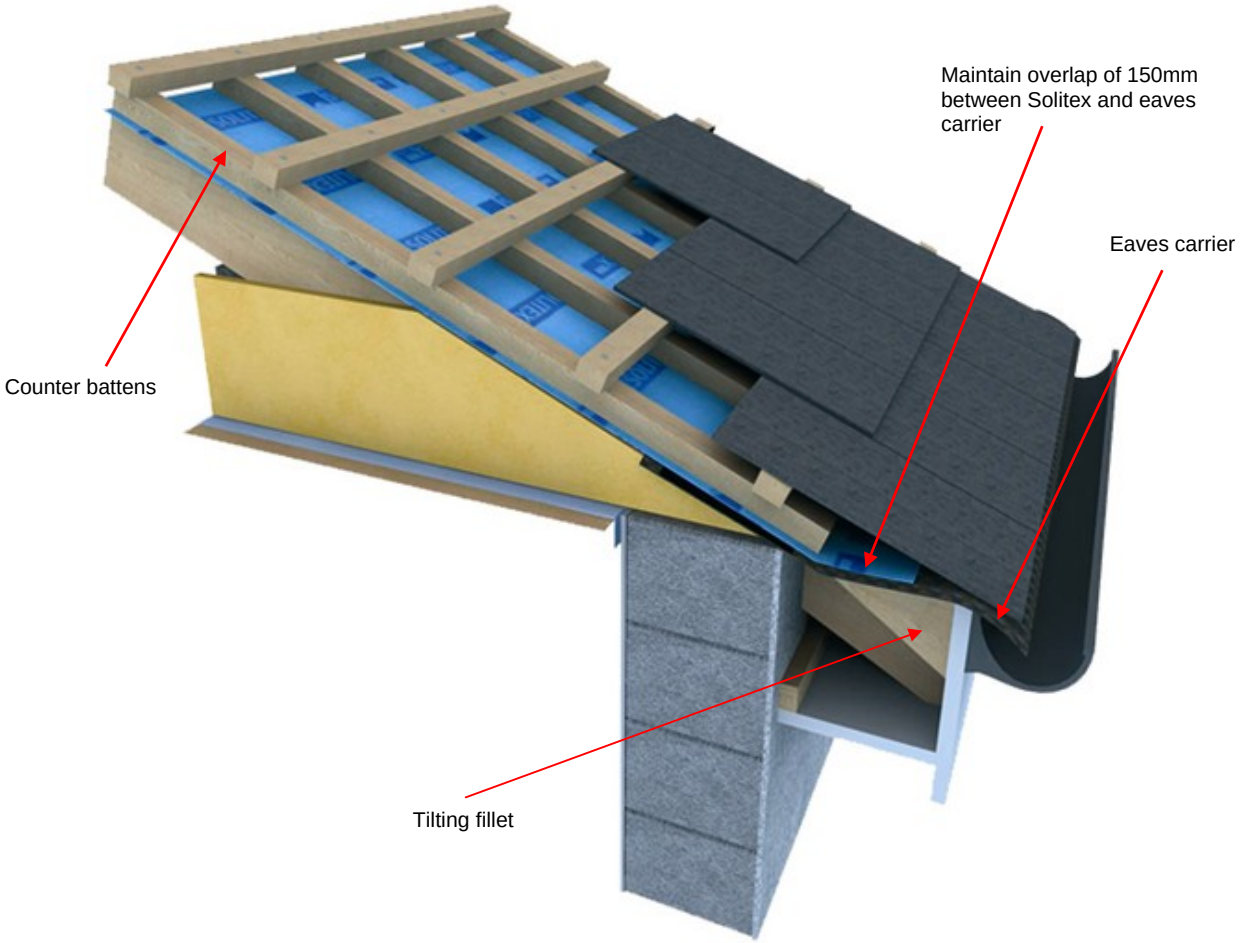


Figure 4: Non ventilated cold roof detail

3.1 GENERAL
Solitex Plus and Solitex UD roof tile underlays provide a satisfactory underlay in tiled and slated ventilated pitched roofs constructed in accordance with ICP 2:2002, BS 5534-1:1997 and BS 8000-6:1990 *Code of practice for slating and tiling of roofs and claddings*.

3.2 STRENGTH
Solitex Plus and Solitex UD will resist the loads associated with the installation phase of the roof.

Solitex Plus and Solitex UD roof tile underlays on fully supported roofs have adequate resistance to wind uplift forces in most locations in Ireland and may be considered superior in strength to Type 1F reinforced bitumen underlay as defined in BS 747:2000 *Reinforced bitumen sheets for roofing – Specification.*

Solitex Plus and Solitex UD roof tile underlays on unsupported roofs has adequate resistance to wind uplift forces and may be considered superior in strength to Type 1F reinforced bitumen underlay as defined in BS 747:2000.

Tests on Solitex Plus and Solitex UD roof tile underlays indicate superior nail tear resistance and superior resistance to nail tear propagation under design wind speeds.

Design wind speeds should be determined – the maximum net wind pressure must not exceed 2.5 kPa as calculated in accordance with BS 6399: Part 2:1997 *Code of practice for wind loads*.

3.3 WEATHERTIGHTNESS
Tests confirm that Solitex Plus and Solitex UD 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 ICP 2:2002, BS 5534-1:1997, BS 8000-6:1990 and IS EN 13111:2001 *Flexible sheets for waterproofing – Underlays for discontinuous roofing and walls – Determination of resistance to water penetration.*

For effective water management of a roof subject to severe driving rain conditions all underlay must be installed so that any water leaking through the roof tiles/slates is carried by the draped deflection of the underlay to the gutters.

3.4 VENTILATION
In the Solitex Plus and Solitex UD non-ventilated roof systems, the risk of condensation is equivalent to or less than that for current conventionally ventilated cold roof systems meeting the criteria of BS 5250:2002.

In conventional ventilated warm roof construction attention should be given to ensuring that there is adequate ventilation to the roof space at eaves level in accordance with the Building Regulations 1997 to 2006. There is no need for high level ventilation when using Solitex Plus and Solitex UD as they have a water vapour resistance significantly below that quoted as a maximum for conventional roof tile underlays in BS 5534-1:2003, and hence movement of moisture vapour will take place through the underlays.

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.

A sealed vapour control layer such as pro clima INTELLO PLUS should be used with all types of insulation.

3.5 CONSERVATION OF FUEL AND ENERGY
In conventional roof constructions energy loss by air exfiltration and infiltration can account for a significant portion of the total heat loss through the roof. Therefore it is important to ensure that a continuous sealed vapour control layer is applied in all roof constructions. The pro clima airtight system including INTELLO PLUS vapour check and the range of pro clima airtightness sealing accessories will significantly reduce the potential for interstitial condensation, reduce heat loss due to convection and significantly reduce the possibility of structural degradation, dry rot and mould growth.

4.1 BEHAVIOUR IN FIRE

Solitex Plus and Solitex UD roof tile underlays have similar properties in relation to fire as those which are acceptable under BS 5534-1:1997, and so will present no additional fire hazard to a roof structure in which they are incorporated.

Solitex Plus and Solitex UD roof tile underlays have the risk of fire spread when used unsupported if the material is accidentally ignited during maintenance works etc. (e.g. roofer or plumbers torch). As with all types of sarking material, care must be taken during building and maintenance to avoid the material becoming ignited.

When the product is used in a fully supported situation, the reaction to fire will be determined by the supporting board.

The toxicity risks in relation to the product in the event of fire are negligible when used in a roof.

Solitex Plus and Solitex UD roof tile underlays being combustible material must be separated from chimneys and flues as indicated in cl. 2.15, 2.16 and 2.17 of TGD to Part J of the Building Regulations 1997 to 2006.

4.2 WATER PENETRATION

Solitex Plus and Solitex UD roof tile underlays, when used in accordance with this Certificate, present no significant risk of water penetration.

4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK

Solitex Plus and Solitex UD roof tile underlays will provide water vapour resistance less than that quoted as a maximum for conventional roof tile underlays in BS 5534-1:2003, and hence movement of moisture vapour can take place through the underlay. This standard also describes the factors to be considered in reducing condensation to a satisfactory minimum. The general design guidelines contained in TGD to Part F of the Building Regulations 1997 to 2006 and BS 5250:2002, Sections 8.4.2.2 to 8.4.2.6 must be met with installing this product. Typical values of water vapour resistance are given in Table 3.

Solitex Plus and Solitex UD roof tile underlays when being installed should be treated as vapour permeable underlays when considering the ventilation requirements.

The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading due to wet trades, such as in-situ cast concrete slabs or plaster. The risk of condensation diminishes as the building naturally dries out.

4.4 DURABILITY AND MAINTENANCE

Solitex Plus and Solitex UD roof tile underlays, when installed in accordance with this Certificate, Certificate holder's instructions and relevant codes of practice, is virtually unaffected by conditions normally found in a roof space and will have a design life comparable with that of the roof and in accordance with BS 7543:1992 *Guide to the durability of building elements, products and components*. 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.

4.5 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour permeability
- Dimensional accuracy
- Nail tear resistance
- Tear strength
- Elongation at break
- Dimensional stability
- UV stability
- Efficiency of the construction and installation process

4.6 OTHER INVESTIGATIONS

(i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability 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 visits were conducted to assess the practicability of installation and the history of performance in use of the product.

(iv) Driving rain resistance was assessed.

(v) A condensation risk analysis was performed.

5.1 National Standards Authority of Ireland ("NSAI") following consultation with the Irish Agrément Board ("IAB") 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 manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:

(a) the specification of the product is unchanged.

(b) the Building Regulations 1997 to 2006 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 IAB are paid.

5.2 The IAB 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 IAB mark and certification number and must remove them from the products already marked.

5.3 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.

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

5.5 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. 1989, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 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.

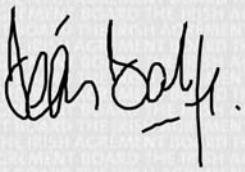
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is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

The Irish Agrément Board

This Certificate No. **02/0138** is accordingly granted by the NSAI to **MacCann & Byrne** on behalf of The Irish Agrément Board.

Date of Issue: **February 2002**

Signed



Seán Balfe
Director of the Irish Agrément Board

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

Revisions: May 2007

- Classification of Solitex UD and Solitex Plus as vapour permeable underlays