

## Supertec P4mm, PA 4mm and PA 4,5kg/m<sup>2</sup> Roof Waterproofing Systems

Système d'étanchéité pour toitures  
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 2011**.



### PRODUCT DESCRIPTION:

This Certificate relates to Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> Roof Waterproof Systems, comprising a range of polyester reinforced, APP modified bitumen membranes.

This Certificate certifies compliance with the requirements of the Irish Building Regulations 1997 to 2001.

### USE:

This Certificate covers the use of Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roofing membranes as fully bonded or loose-laid and ballasted two layer waterproof waterproofing systems on flat roofs with limited access. The Systems are intended for use with substrates in accordance with the BS 8217:2005 *Code of practice for Reinforced bitumen membranes for roofing* and for all normal roofing details such as parapets, outlets and roof lights.

### MANUFACTURE AND MARKETING:

#### The product is manufactured by:

Pluvitec Spa.  
Via Quadrelli 69,  
37055 Roco all'Adige (VR)  
Italy.  
Tel: 0039 045 6608111  
Fax:0039 045 6608177  
E-mail: info@pluvitec.com  
Web: www.pluvitec.com

#### The product is marketed in Ireland by:

Laydex Ltd.  
Unit 3 Allied Industrial Estate,  
Kylemore Road,  
Dublin 10  
Tel: (01) 6426600  
Fax:(01) 6426601  
Email: sales@laydex.ie  
Web: www.laydex.ie

## 1.1 ASSESSMENT

In the opinion of the Irish Agrément Board (IAB) Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems, installed in Ireland by trained, licensed contractors in accordance with processing specifications issued by Pluvitec and used in the context of this Certificate, meet the requirements of the Irish Building Regulations 1997 to 2011 as listed in section 1.2 of this Certificate.

## 1.2 BUILDING REGULATIONS 1997 to 2011 REQUIREMENT:

### Part D – Materials and Workmanship

**D3** – Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roofing membranes, as certified in this Irish Agrément Board Certificate, are manufactured from materials which are proper materials fit for their intended use. (See Part 4 of this Irish Agrément Board Certificate).

**D1** – Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems, used in accordance with this Irish Agrément Board Certificate, can meet the requirements for workmanship.

### Part A – Structure

#### A1 – Loading

Tests indicate that a roof incorporating Supertec P 4mm, PA 4mm or PA 4,5 kg/m<sup>2</sup> - roof waterproofing systems can meet the loading requirements, provided the installation complies with the conditions set out in Section 2.6 and Part 3 of this Certificate.

### Part B – Fire Safety

#### B4 – External Fire Spread

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems can meet the requirements for resistance to fire penetration and the distance of spread of flame for roofs, as indicated in Part 4.1 of this Certificate.

### Part C – Site Preparation and Resistance to Moisture

#### C4 – Resistance to Weather and Ground Moisture

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> - Roof waterproofing systems can meet the weather resistant requirements when installed as indicated in Part 2.6 of this Certificate.

**2.1 PRODUCT DESCRIPTION**

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roofing membranes are manufactured from polyester / glass fibre strand reinforcement coated with APP modified bitumen. The lower face of each membrane is covered with a non-sticking HDPE film for heat application, or as an alternative, with a woven non-woven polypropylene mat. The membranes are normally black in colour, but when covered with natural mineral slates they are available in various colours on request.

This certificate covers the use of Supertec P4mm as a cap sheet in loose laid and ballasted applications, while the Supertec PA 4mm and PA 4,5 kg/m<sup>2</sup> membranes are suitable for use as cap sheets in fully bonded applications

**2.2 PRODUCT RANGE**

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> - roofing membranes are supplied in rolls to the nominal characteristics given in Table 1.

Table 1: Nominal Characteristic			
	Supertec P 4mm	Supertec PA 4mm	Supertec PA 4,5 kg/m <sup>2</sup>
Thickness (mm)	4.0 (±5%)	4.0 (±5%) <sup>(1)</sup>	3.3 (±5%) <sup>(1)</sup>
Weight (kg/m <sup>2</sup> )	4.2 (±10%)	5.5 (±15%)	4.5 (±15%)
Roll width (m)	≥ 1.0		
Roll length (m)	≥ 10.0		
<sup>(1)</sup> Measured at overlap			

**2.3 ANCILLARY ITEMS**

- Idroprimer – water based bituminous dispersion applied over concrete surfaces in order to enhance adhesion of subsequent layers.
- Acriltec – water based acrylic paint used as a light protection over non self-protected membranes.
- Allutec – Solvent based bituminous aluminium paint used as a light protection over non self protected membranes
- Primertec – solvent based bituminous solution applied over concrete surfaces in order to enhance adhesion of subsequent layers.

**2.4 MANUFACTURE**

The membranes are manufactured by coating a single strand polyester and glass fibre strand carrier with a mix of distilled bitumen - 160/300 modified bitumen with polypropylene polymers in atactic form (APAO) with small amounts of additives.

The upper face of the Supertec P 4mm is treated with inert minerals, or a non-woven material, while the Supertec PA 4mm and Supertec PA 4,5 kg/m<sup>2</sup> are coated with a layer of natural mineral slate granules.

The lower face of each membrane type is covered with a non-sticking HDPE film for heat application, or as an alternative with a woven non-woven polypropylene mat.

**2.4.1 QUALITY CONTROL**

Quality control, carried out on the raw materials, during production and on the finished product, includes checks on:

- dimensions
- heat stability
- dimensional stability
- tensile strength
- elongation at break
- cold flexibility
- tear strength
- peel resistance at joints
- adhesion or granules
- position of reinforcement

The management systems of Pluvitec have been assessed and registered as meeting the requirements of ISO 9001:2008 by SGS (Certificate No. IT97/9497).

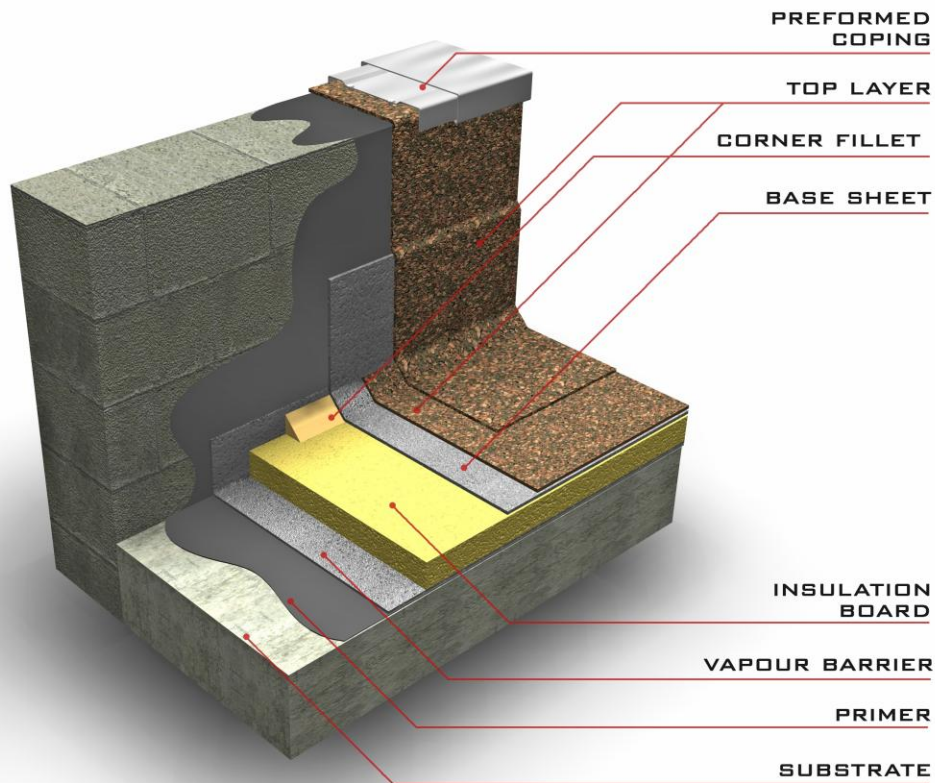
**2.5 DELIVERY, STORAGE AND MARKING**

Each roll carries a label which identifies the product name, thickness, dimensions, carrier type, batch number and a barcode. The rolls are stacked vertically on pallets and protected with shrinkage foil.

Rolls should be stored under cover with no more than two pallets stacked on top of each other using wood spacers.

Solvents and sealants must be stored in a dry, sealed area reserved for flammable materials.

**Figure 1 – Parapet Wall with Coping Detail**



## 2.6 DESIGN AND INSTALLATION

### 2.6.1 General

All installation work must be carried out by trained installers in accordance with the manufacturers installation instructions.

It should be noted that overall responsibility for the structural design for the building, including designing for dead and superimposed loading on the roof, rests with the architectural / engineering design team for the Developer. BS 8747:2007: *Reinforced bitumen membranes (RBMs) for roofing – Guide to selection and specification* should be used to determine the correct system specification for each project. Older roofs to be retrofitted must be inspected to determine their suitability and any repairs that may be required.

Roof decks to which the covering is applied, must comply with BS 6229: 2003 *Code of practice for flat roofs with continuously supported coverings*. Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems may be laid in conditions normal to roofing work, but should not be laid in rain, snow or heavy fog or at temperatures below +5°C.

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> Roof waterproofing systems should never be laid on a wet substrate.

Surfaces to be covered must be firmly fixed, clean, dry, smooth and free from frost, contaminants, voids and protrusions. All preliminary work including the formation of upstands, kerbs, box gutters, expansion joints, fillets, anchoring, etc. must be complete and satisfactory.

Timber decking must be free from wane, pitch pockets, decay and insect attack. Moisture content of the timber decking must be less than 22% at time of covering.

No petroleum based solvents or other chemicals harmful to bitumen should be allowed to come into contact with the roof surface.

**2.6.2 INSTALLATION PROCEDURE**

Installation of Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems is carried out using traditional methods of laying bituminous felts, to meet the requirements of BS 8000-4:1989: *Workmanship on Building sites – Code of practice for waterproofing*, BS 8217:2005: *Reinforced bitumen membranes for roofing – Code of practice* and the certificate holders instructions.

It is important that a suitable vapour barrier is used beneath any insulation material to reduce the risk of condensation occurring in the insulation/waterproofing system.

The vapour control layer should be laid with fully bonded 80-100 mm side and 120-150 mm end laps. At all edges, abutments, upstands, kerbs and other penetrations, dress the vapour control sufficiently to provide a minimum 25mm seam when overlapped by the roof covering or turn back a minimum of 150 mm over the insulation and seal down.

All penetrations through the vapour control layer should be sealed using bonding or taping methods as per the certificate holder's instructions.

Insulation materials should comply with the BS 8217:2005 or be the subject of a current IAB Agrément Certificate. The compatibility of the insulation material and the Supertec membranes should be checked with the Certificate holder.

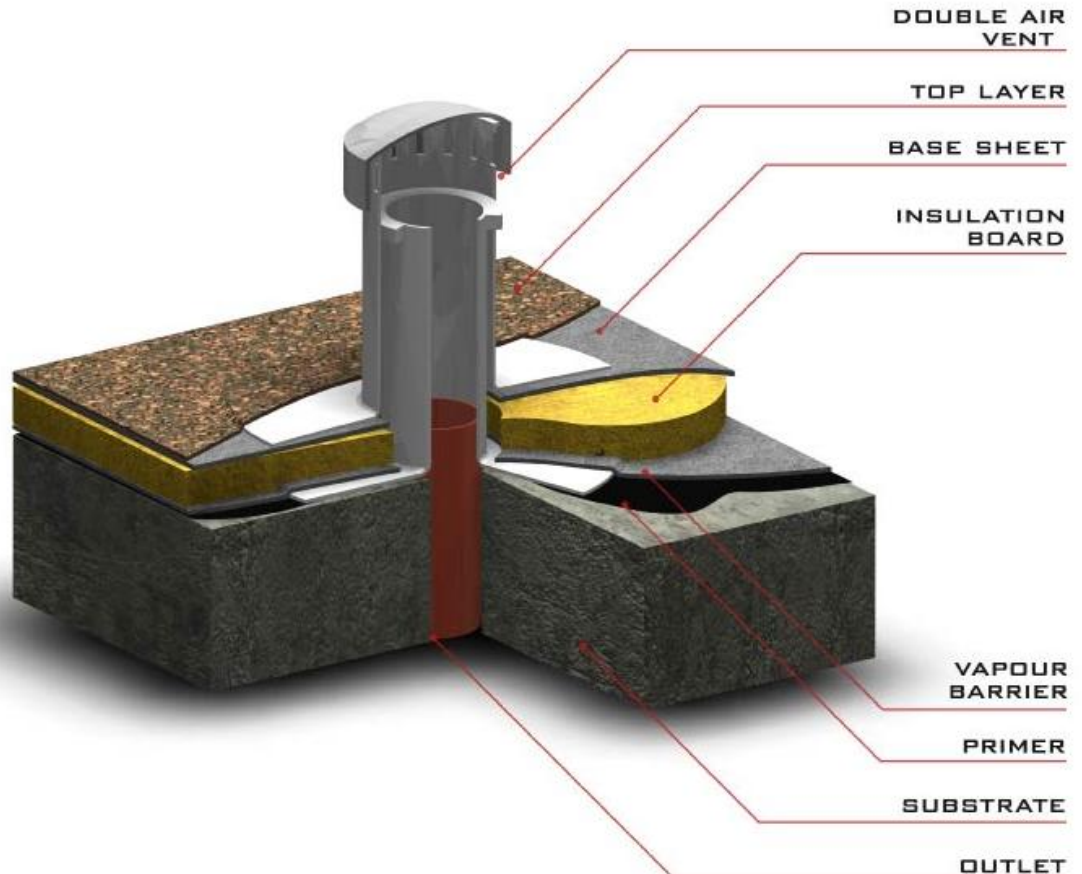
Insulation boards should be laid with long edges fully supported, lightly butted together with staggered end joints, with mechanical fixing as required to resist wind loading determined in accordance with the requirements of BS 6399-2:1979.

**2.6.2.1 Fully-bonded applications**

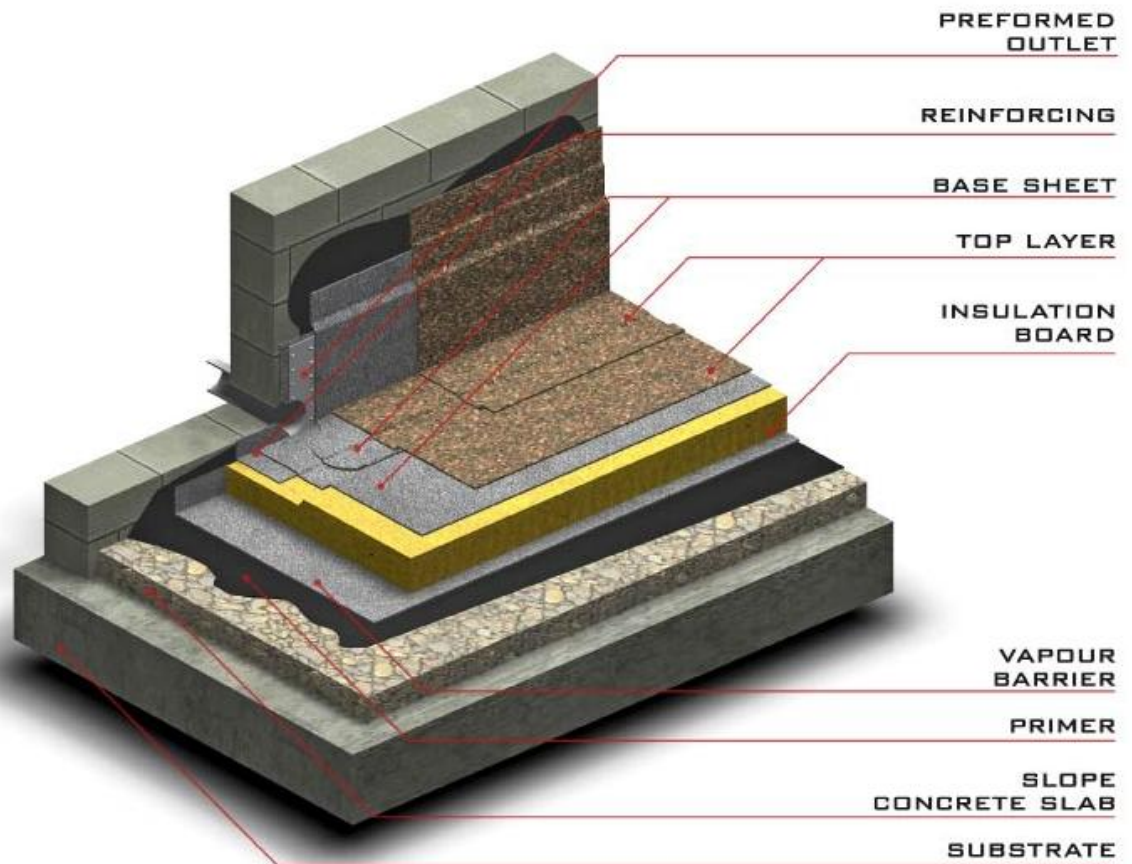
Supertec PA 4mm and PA 4,5 kg/m<sup>2</sup> membranes have been assessed as meeting the requirements of the Irish Building Regulations 1997 to 2011 for use as cap sheets in fully bonded applications

Where practicable installation should commence on the lowest part of the roof and the membrane unrolled up the slope with side laps of 100mm approx. and end laps of 150mm approx. The sheets must be arranged on the roof in order to avoid the overlapping of more than three sheets at any point, ensuring water will drain over and not into the laps.

**Figure 2 - Vent Pipe Penetration Detail**



**Figure 3 – Rainwater Outlet Detail**



Membranes base sheets are bonded to the substrate by heating the waterproofing mass with an appropriate propane gas torch to ensure total adhesion is achieved.

Successive layers should be applied with minimum delay, ensuring that no moisture is trapped. Overlaps are bonded by applying the flame over the total width of the lap with immediate pressure being applied to the seam. In all cases an uninterrupted extrusion of molten material should be visible along the seam.

All subsequent membrane layers are fully-bonded to the previously applied layers ensuring both longitudinal and traversal joints are staggered from the underlay joints as detailed in BS 8217:2005, figure 17.

At vertical edges, or at locations of protrusions in the roof, affected areas must first be primed and have a supplementary strip of membrane applied prior to the application of the final membrane layer.

Detailing at expansion joints, up-stands, roof edges and gutters should be performed in accordance with the requirements of BS 8217:2005 and the certificate holders instructions.

#### **2.6.2.2 Loose-laid and ballasted applications**

The Supertec P 4mm membrane has been assessed as meeting the requirements of the Irish Building Regulations 1997 to 2011 for use as a cap sheet in loose-laid and ballasted applications.

For loose-laid applications, where the membrane is not adhered to the substrate, a heavy protection must always be applied, normally consisting of:

- A layer of loose laid gravel with a thickness of at least 50mm or a mass  $\geq 80\text{kg/m}^2$  (minimum aggregate size 4mm maximum 32 mm).
- Sand/cement screed to a thickness of at least 30mm
- Cast stone or mineral slabs of at least 40mm thickness.

Depending on the application, a separation layer should be installed between the membrane and final ballast coating. The advice of the certificate holder should be sought in this regard. Reference should be made to the requirements of BS 8217:2005 regarding the installation of surface protection.

- 3.1** Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems, when installed in accordance with this certificate and the manufacturers instructions, are suitable for use on insulated decks, concrete, timber or metal decks as a fully bonded, or loose laid and ballasted, double layer waterproofing system on flat roofs with limited access.
- 3.2** Limited access roofs are defined for the purpose of this Certificate as those roofs that are subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc.
- Where traffic is in excess of access loads only, special precautions should be taken to protect the waterproofing membrane by the use of a suitable walkway, as described in BS 8217:2005 clause 8.19
- 3.3** Insulation materials should comply with BS 8217:2005 or be the subject of a current IAB Agrément Certificate, provided that nothing in the Certificate prevents the use of Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems with that product.
- Non-traditional insulation systems or materials used in conjunction with this roofing system must only be used if approved by and in accordance with the certificate holder's instructions.
- 3.4** Timber decking must be free from wane, pitch pockets, decay and insect attack. Moisture content of the timber decking must be less than 22% at time of covering.
- 3.5** Supertec PA 4mm and PA 4,5 kg/m<sup>2</sup> roofing membranes are also suitable for use where appropriate, as an exposed cap-sheet or in detailed work.
- 3.6** Decks should be designed in accordance with the relevant clauses of BS 6229: 2003 *Code of Practice for flat roofs with continuously supported coverings*, or other approved design guides.
- 3.7** Condensation risk should be assessed in accordance with BS 6229: 2003 *Code of practice for flat roofs with continuously supported coverings*, and BS 5250:2002 *Code of practice for control of condensation in buildings*, and only approved vapour barriers should be used. When using a vapour control layer the deck surface should first be primed with PRIMERTEC or IDROPRIMER Primer which should be allowed to dry thoroughly before covering.
- 3.8** Although Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing systems are not affected by standing water, it is good practice to provide suitable falls to facilitate drainage. Where this is not possible additional drainage outlets should be employed.
- 3.9** Flat roofs are defined for the purpose of this Certificate as those roofs up to 10° to the horizontal. See section 4.1 of this certificate for the fire test rating and classification per BS 476: Part 3: 2004: *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs*, and B.S. EN 13501-5: 2005: *Fire classification of constructional products and building elements, Part 5 - Classification using data from external fire exposure to roof tests*, of a flat roof system using the Supertec PA 4mm roof waterproofing membrane. The designation of other roof systems should be confirmed by test or assessment.
- 3.10** To minimize ponding, and in accordance with BS 6229:2003, it is recommended that flat roofs should have a Design Fall of 1:40 to achieve a Minimum Finished fall of 1:80, unless a detailed analysis of the roof is available, including overall and local deflection and direction of falls.
- 3.11** When fully bonded in accordance with the Certificate holders instructions, the adhesion of Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roofing membranes is sufficient to resist the effects of wind suction, elevated temperatures and thermal shock conditions likely to occur in practice.

#### 4.1 BEHAVIOUR IN FIRE

**When tested in accordance with BS 476: Part 3: 2004 Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs, a roof tested in the flat position comprising:**

- 13mm thick chipboard wood deck, Specialtec V2mm vapour control layer, Recticel Eurothane F TS insulation board (80mm thick Polyurethane insulation +15mm Perlite), Specialtec V3mm base sheet and Supertec PA 4mm cap sheet

**achieved an EXT.F.AA rating.**

The above roof system also **achieved a Broof (t4)** classification per B.S. EN 13501-5: 2005, when evaluated against I.S. ENV 1187 Test 4: *Test method for external fire – Exposure to roofs*.

**The designation of other roof systems should be confirmed by test or assessment.**

When using the Supertec P 4mm membrane where additional protection is to be applied, reference should be made to TGD B, Appendix A, Table A5, and to Commission Decision 2000/553/EC for conditions and surface protections which fulfil the 'external fire performance' requirements of TGD B to the Irish Building Regulations. See Cl. 2.6.2.2 of this Certificate for protections that satisfy this requirement.

#### 4.2 THERMAL INSULATION

Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> roof waterproofing membranes will contribute to the U-value of roofs in proportion to the thickness and type of the membranes used and the surface finish employed.

#### 4.3 CONDENSATION RISK

The interstitial condensation risk of the roof should be assessed in accordance with BS 6229: 2003, and BS 5250:2002, and only approved vapour barriers should be used.

#### 4.4 MAINTENANCE

As Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> - Roof waterproofing systems have little need for maintenance, however the roofs should be inspected at least one per year to evaluate the effects of extremes of weather as detailed in BS 8217:2005 clause 10. Drainage outlets and gutters should be regularly maintained.

In the event of accidental damage, repair should be carried out by a licensed Pluvitec contractor in accordance with the certificate holder's instructions.

#### 4.5 WEATHERTIGHTNESS

Test data examined by the IAB confirms that Supertec P 4mm, PA 4mm and PA 4,5 kg/m<sup>2</sup> Roofing membrane and joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building. They are capable of accepting minor structural movements without damage and so meet the requirements of Part C of the Building Regulations 1997 to 2011.

#### 4.6 DURABILITY

In the opinion of the IAB, when installed in accordance with this Certificate and adequately supported by the substrate, the system's life as a weatherproof covering will be at least 25 to 30 years with continuous inspection and maintenance.

Repairs can be carried out by the procedures listed above and are effective in restoring weather tightness.

#### 4.7 TOXICITY

The membranes are not toxic in normal service.

#### 4.8 SECURITY OF FIXING

Properly fully bonded membranes have bond strengths capable of resisting wind loads. Membranes, being flexible, have good resistance to cyclic movement.

#### 4.9 OTHER INVESTIGATIONS

- (i) Existing data on properties in relation to fire, and durability were assessed.
- (ii) The manufacturing process was examined including methods adopted for quality control and details were obtained of the quality and composition of the materials used.
- (iii) The IAB carried out site visits to assess the history of use and practicability of installation of the product.



Table 2 - Properties

<b>Characteristics of Polyester- Glass Composite Reinforcement</b>						
<i>Tests/Units - MOAT 64</i>			<i>Declared Value</i>		<i>Measured Value</i>	
Mass per unit area (g/m <sup>2</sup> )			190 ± 15 %		213	
Maximum tensile force (N/50 mm)						
Longitudinal			550 ± 20%		517	
Transverse			550 ± 20%		652	
Elongation at break (%)						
Longitudinal			(35 ± 15)%		35	
Transverse			(35 ± 15)%		40	
<b>Characteristics of the Coating medium</b>						
<i>Tests/Units - MOAT 64</i>			<i>Declared Value</i>		<i>Measured Value</i>	
Penetration at 60 °C (dmm)			≥ 40		105	
Ring and ball softening temperature (°C)			≥ 150		151.3	
Fines / Ash content (%)			12 ± 5 absolute		11.14	
<b>Characteristics of the sheets</b>						
<i>Tests/Units- MOAT 64</i>	<b>Supertec P 4mm</b>		<b>Supertec PA 4mm</b>		<b>Supertec PA 4,5 kg/m<sup>2</sup></b>	
	<i>Declared</i>	<i>Measured</i>	<i>Declared</i>	<i>Measured</i>	<i>Declared</i>	<i>Measured</i>
Tensile strength (N/50mm) (EN 12311-1)	L: 850 ± 20% T: 750 ± 20%	L: 766 T: 821	L: 850 ± 20% T: 750 ± 20%	L: 731 T: 791	L: 850 ± 20% T: 750 ± 20%	L: 814 T: 680
Elongation at break (%) (EN 12311-1)	L: 45 ± 15% T: 45 ± 15%	L: 45 T: 48	L: 45 ± 15% T: 45 ± 15%	L: 40 T: 44	L: 45 ± 15% T: 45 ± 15%	L: 40 T: 40
Amount of Mineral (g/m <sup>2</sup> )	-	-	≥ 500	1203	≥ 400	812
Low Temp.Flex. °C Unaged (EN 1109) After 168 D @ 70 °C	L/T ≤ -20 L/T ≤ -5	L/T -20 L/T -20	L/T ≤ -20 L/T ≤ -5	L/T -20 L/T -5	L/T ≤ -20 -	L/T -20 -
Dimensional Stability (%) (EN 1107-1)	≤ 0.3	L: -0.19 T: -0.08	≤ 0.3	L: -0.24 T: -0.04	≤ 0.3	L: -0.17 T: -0.05
Heat Resistance (°C) (EN 1110)	> 140	155	> 140	155	> 140	-
	<i>Requirement</i>	<i>Measured</i>	<i>Requirement</i>	<i>Measured</i>	<i>Requirement</i>	<i>Measured</i>
Resistance to tearing Nail shank (N) (EN 12310-1)	L/T ≥ 150	L: 225 T: 240	L/T ≥ 150	L: 235 T: 255	L/T ≥ 150	L: 225 T: 220
Static indentation Resistance (EN 12730)	> L20	L25	> L20	L25	> L20	L25
Resistance to water pressure (EN 1928)	No loss at 10 kPa	No loss at 10 kPa	No loss at 10 kPa	No loss at 10 kPa	No loss at 10 kPa	No loss at 10 kPa
Loss of Mineral (%) (EN 12039)	-	-	Loss ≤ 30	18.9	Loss ≤ 30	21.6

**5.1** 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 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 2011 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 Agrément are paid.

**5.2** 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.

**5.3** 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 2005, 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.

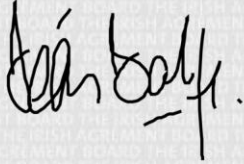
**5.7** Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it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

## The Irish Agrément Board

This Certificate No. **07/0294** is accordingly granted by the NSAI to **Pluvitec Spa.** on behalf of The Irish Agrément Board.

Date of Issue: **December 2007**

Signed



**Seán Balfe**  
**Director of NSAI Agrément**

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.n sai.ie](http://www.n sai.ie)

**Revisions: February 2013 – To include revised cold flexibility data for the Supertec product range.**