

**NSAI**  
Agrément

## CERTIFICATE NO. 06/0262

Protan AS,  
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# Protan Roof Waterproofing Systems

## Système d'étanchéité pour toitures

### Dachabdichtungen

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

NSAI Agrément 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 2019**.



#### PRODUCT DESCRIPTION:

Protan SE and EX are roofing membranes manufactured from a pliable PVC with a central core of knitted polyester. They are installed using hot-air welded lap joints, mechanically fixed using approved fasteners. The system includes a range of accessories designed to deal with parapet, edge, rainwater outlet and drainage details.

In the opinion of NSAI the Protan Roof Waterproof Systems as described in this Certificate comply with the requirements of the Irish Building Regulations 1997 to 2019.

#### USE:

This Certificate covers the use of the Protan SE and EX Roofing Membranes as mechanically fastened roof waterproofing layers suitable for use on pitched and flat roofs with limited access.

#### MANUFACTURE AND MARKETING:

The membrane system is manufactured by:

Protan AS  
P.O. Box 420  
NO-3002 Drammen  
Norway  
Tel: 0047 32221600  
Fax: 0047 32221700  
Web: [www.protan.com](http://www.protan.com)

The product is marketed in Ireland by:

Moy Materials Ltd.  
Unit K South City Business Park  
Whitestown Way  
Tallaght  
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[info@moymaterials.com](mailto:info@moymaterials.com)

## 1.1 ASSESSMENT

In the opinion of NSAI Agrément the Protan SE and EX Roofing Membranes installed in Ireland by Protan trained and registered contractors, in accordance with specifications issued by Protan AS and used in the context of this Certificate, can meet the requirements of the Building Regulations 1997 to 2019 as listed in section 1.2 of this Certificate.

## 1.2 BUILDING REGULATIONS 1997 to 2019

### REQUIREMENT:

#### **Part D – Materials and Workmanship**

**D3** – Protan SE and EX Roof Waterproofing Systems, as certified in this Certificate, are manufactured from materials which are proper materials fit for their intended use (see Part 4 of this Certificate).

**D1** – Protan SE and EX Roof Waterproofing Systems, used in accordance with this Certificate, meet the requirements of the building regulations for workmanship.

#### **Part A – Structure**

##### **A1 – Loading**

Protan SE and EX Roof Waterproofing Systems can meet the loading requirements, provided the installation complies with the conditions described in this Certificate.

#### **Part B – Fire Safety**

##### **Part B Vol 2 – Fire Safety**

##### **B4 & B9 – External Fire Spread**

Protan SE and EX Roof Waterproofing Systems can meet the requirements for resistance to fire penetration and the distance of spread of flame for roofs, as indicated in Section 4.1 of this Certificate.

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

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

Protan SE and EX Roof Waterproofing Systems can meet the requirements when installed as indicated in Section 2.6 of this Certificate.

#### **Part F – Ventilation**

##### **F2 – Condensation in Roofs**

Protan SE and EX Roof Waterproofing Systems can meet the requirements of this regulation, when designed and installed in accordance with this certificate.

#### **Part L – Conservation of Fuel and Energy**

##### **L1 - Conservation of fuel and energy**

Protan SE and EX Roof Waterproofing Systems, in conjunction with the full roof build-up can contribute to or meet the requirements of this regulation, when designed and installed in accordance with this certificate.

## 2.1 PRODUCT DESCRIPTION

The Protan SE and EX Roofing Membranes consist of knitted polyester reinforced PVC roofing sheets, with hot-air welded lap joints, mechanically fastened using approved fasteners. Installation must only be carried out by Protan trained and registered installers.

## 2.2 PRODUCT RANGE

**Table 1: Nominal Characteristics**

Characteristic	Protan SE	Protan EX
<b>Thickness (mm)</b>	1.2, 1.6, 1.8	1.2, 1.6
<b>Mass per unit area (kg/m<sup>2</sup>)</b>	1.4, 1.8, 2.1	Note 1
<b>Roll Width (m)</b>	1, 2	1, 2
<b>Roll Length (m)</b>	20, 20, 15	20, 20
<b>Weight. Polyester core (g/m<sup>2</sup>)</b>	80	80
<b>Polyester fleece – Mass per unit area (g/m<sup>2</sup>)</b>	N/A	180

Note 1: Protan EX - Same as for SE membrane with additional mass of fleece.

Protan SE and EX are available in a range of standard thicknesses as shown in Table 1 and in a range of colours to the characteristics and tolerances given in Table 1. Field of application of the SE and EX membranes is as follows:

- Protan SE can be used as a roofing membrane on a range of underlay but needs a separate migration barrier/levelling layer on polystyrene underlay and for re-roofing applications.
- Protan EX, laminated with polyester felt on the underside, can be laid directly over existing systems.

## 2.3 ANCILLARY ITEMS

- Protan G1.5mm- a 1.5mm thick PVC membrane for use on detail work.
- Approved telescopic tube, flat metal washers, non-thermal bridging plate, and fasteners range to suit the relevant decks.

- Protan Secret Fix Pocket – a factory-produced pocket for securing the membrane at upstands.
- Protan Fixing Bar- a roll-formed 1.5mm bar for use in conjunction with fixing pocket.
- Protan PVC Laminated Metal – a 0.6mm thick galvanized steel sheet, factory laminated with 1.4mm thick Protan G membrane.
- Preformed internal and external corners.
- Rainwater Outlets – stainless steel outlets with a Protan membrane flange.
- Pipe Cloaks/Collars - preformed cloaks for use at penetrations.
- Protan Omega and Triangular Profiles – for use to create architectural features on roofs.
- Protan 2.4mm GT Terrace Grade – a 2.4mm thick PVC membrane for use on access walkways and lightly-trafficked terraces.
- Protan Proclip Decking – for use with walkways and terraces.
- Protan Pavepad – bearing pads for concrete slabs.
- Polypropylene Geotextiles - a range of 140 g/m<sup>2</sup> to 800 g/m<sup>2</sup> non-woven mats, for use as protective layers over existing bitumen roofing or uneven substrates.
- Protan Constant Force Post – used as a part of a ManSafe System.
- Protan Lightning Clips – protection cable anchor clips.
- Protan Vapour Control Barrier.

## 2.4 MANUFACTURE

Protan SE and EX roof waterproofing membranes are manufactured in accordance with the requirements of I.S. EN 13956<sup>[1]</sup> by coating the polyester fabric base on both sides with a plastisol coating, fused into a homogeneous sheet. The upper PVC coating can be applied in several layers to achieve the required membrane thickness before being passed through a gelation oven.

In the case of the EX membranes, a polyester or glass fibre layer is laminated to the back of the PVC membrane leaving a selvage as required to facilitate welding of lap joints. Stabilizers have been added to the PVC mix to make the roofing membranes more resistant to high and low temperatures, ultraviolet radiation and to limit the spread of flames. The membrane is then cut to width and reeled onto cardboard cores.

#### **2.4.1 Quality Control**

Quality control checks are carried out on the incoming raw materials, during production and on the finished product. The management systems of Protan have been assessed and registered as meeting the requirements of I.S. EN ISO 9001<sup>[24]</sup> and I.S. EN ISO 14001<sup>[25]</sup>.

#### **2.5 DELIVERY, STORAGE AND MARKING**

Protan SE and EX membranes are delivered to site on palletised rolls with polyethylene wrappings. Each pallet and each membrane roll carries a label bearing the product's name, thickness, width, length, and production number, as well as the NSAI Agrément Logo and Certificate number. A production number and recycling symbol to identify the product classification are embossed into the membrane.

Rolls are to be stored on a clean level surface and kept under cover. Adhesives and sealants are to be stored in a dry, secure area for inflammable materials.

#### **2.6 DESIGN AND INSTALLATION**

##### **2.6.1 General**

Installation of Protan SE and EX membranes must be in strict accordance with the manufacturer's fixing instructions and should be carried out only by Protan trained and registered installers, records of whom are kept on the Certificate holder's database.

Installation of the roof Protan Roof Waterproofing system must meet the requirements of the relevant clauses of BS 8000-4<sup>[6]</sup>. Roof decks to which the covering is applied, must comply with BS 6229<sup>[5]</sup>.

Substrates should be clean and free from sharp projections such as nail heads and concrete nibs. Where Protan Roof Waterproof Membranes are laid over rough finished decks, the appropriate protection layer must be used. Protan EX membrane is recommended for installation on wood-based roof sheathing and directly on existing bitumen roofs where the polyester fleece acts as a migration layer.

Plasticized PVC is not compatible with bitumen, coal tar pitch or oil based products and direct contact with such products must be prevented by use of one of the certificate holders recommended separation layers.

The Protan EX membranes are produced with a separation layer laminated to its back side and can therefore be used in these applications without any extra separation layer. The Protan SE membrane must always be installed with a loose separation layer when installed on top of the substrates referenced above.

For each project, Protan undertakes the wind loading calculations for the roofing system as per I.S. EN 1991-1-4<sup>[7]</sup> and Clause A1 of Part A of the Technical Guidance Documents to the Building Regulations. 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. Older roofs to be retrofitted must be inspected to determine their suitability and any repairs that may be required.

Insulation materials should comply with the BS 8217<sup>[2]</sup> or be the subject of a current NSAI Agrément Certificate suitable for this application. The compatibility of the insulation material and the Protan membranes should be checked with the Certificate holder.

To avoid migration, Protan SE with a separate migration barrier must be used when the roof membrane is installed directly on EPS or XPS insulation.

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

Protan SE and EX roofing membranes may be laid in conditions normal to roofing work. Protan roofing membranes can be welded in damp weather or cold temperatures as the membranes are designed to remain flexible in low temperature conditions and have low water absorption.

However, in damp or high humidity conditions, precautions should be taken to avoid trapped moisture in the roof construction. The advice of the certificate holder should be sought if additional information is required in this regard.

Protan provides the roofing specification, including the layout of fixings for each roof. In addition, installed Protan roofing systems are subject to a final inspection by a Protan AS. Field Technician prior to the issue of a Protan Guarantee.

All new roof constructions must incorporate a moisture barrier to prevent condensation saturating the insulation layer. The advice of the certificate holder should be sought if additional information is required in this regard.

### 2.6.2 Installation Procedure

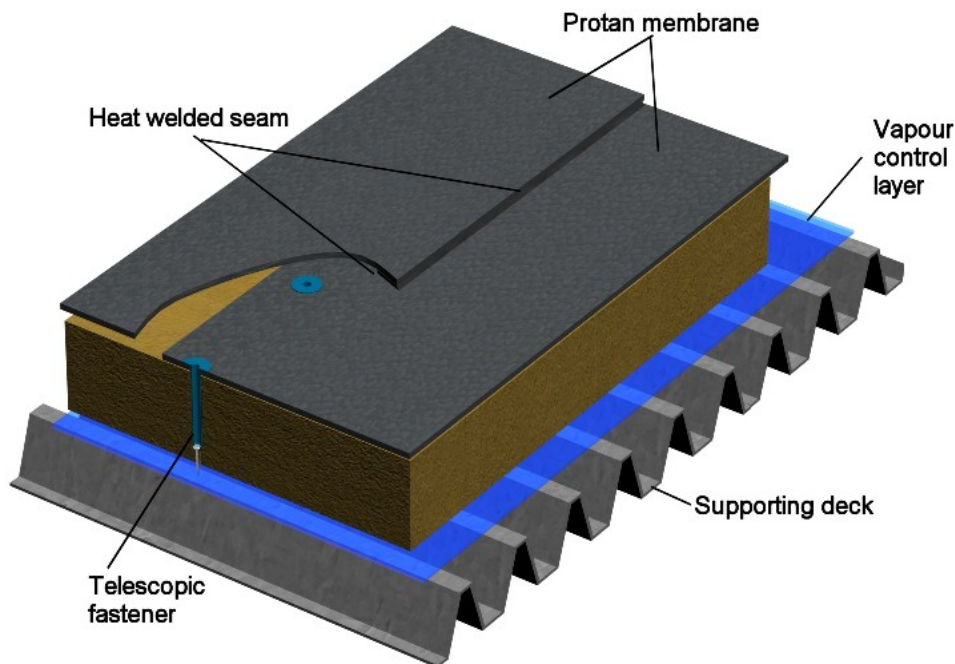
Protan offers two types of systems for mechanical attachment:

- The Standard Overlap system. Suitable for both the Protan SE and EX membranes. See Figure 1
- The Secret Fix Strip System. Suitable for use with the Protan SE membrane only. See Figure 3

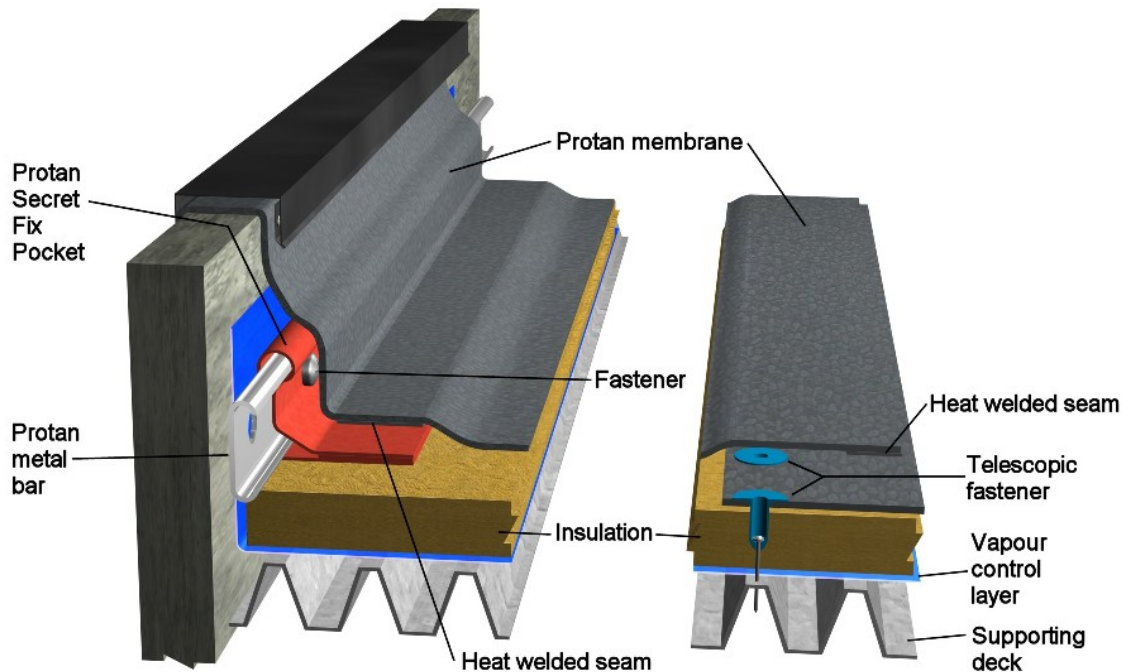
The Protan SE and EX roofing membranes should be laid flat onto the substrate without folds or ripples, and fixed along its longitudinal edge (in the case of the Standard Overlap System), or through factory-welded fixing strips (in the case of the Secret Fix System) to the deck using approved fasteners. See Figures 1 & 2.

The position and the number of fasteners required must be in accordance with the fixing specifications provided by the Certificate holder.

At upstands, or change in angle, the horizontal membrane is secured using the Protan Secret Fix Pocket, heat welded to the underside of the membrane, and Protan metal bars. The bars are sleeved within the pocket and mechanically fastened to the upstand. See Figure 2.



**Figure 1 Standard Overlap - Insulated Roof Construction**



**Figure 2 Parapet with Protan Secret Fix Pocket**

### Steel Decks

Steel decks must be manufactured from galvanized steel with a minimum nominal thickness of 0.7mm.

On the main roof area, where steel decking is used, the membrane should be installed at 90° to the profile. Alternatively, when the Secret-Fix System is used, the membrane should be installed in the same direction as the profile. Self-tapping screws should be selected in accordance with the manufacturer's instructions.

A site pull-out test is required for all refurbishment applications to establish the suitability of the existing steel deck for mechanical fastening.

### Reinforced Concrete Deck

Concrete decks will require pre-drilling. The diameter of the holes should be relevant to the manufacturer's recommendations for the size of the self-drilling anchor or nylon dowel being used.

When re-roofing on concrete decks, fasteners must be anchored in solid concrete. This should be noted, particularly when using cement screeds or intermediate layers.

A site pullout test is required for all applications to establish the suitability of the concrete deck for mechanical fastening, the type of fastener required and the correct tapping hole diameter.

### Timber Decks

Fasteners should be positioned above and fixed to beams or joists. If this is not possible, fasteners must be positioned across the direction of timber planks, provided the planks are sufficiently fastened to withstand the imposed wind loads. When fasteners are to be fixed to Plywood or OSB 3, a minimum board thickness of 18mm must be used. In addition, the fastening screws must penetrate a minimum of 15mm beyond the underside of the board.

A site pull-out test is required for all refurbishment applications to establish the suitability of the existing timber deck for mechanical fastening.

### 2.6.3 Lap Welding Procedure

Welding must only be carried out by Protan trained and registered contractors. To ensure a watertight weld, Protan SE and EX should be lapped by a minimum of 120 mm at side laps and 80mm at end laps.

Hot-air welding is performed by hand or machine using equipment approved by the Certificate holder.

When welding using a machine, test welds should be carried out to ensure the optimum setting for temperature, speed and pressure prior to the start of the work. Peel tests should be carried out at 200 m intervals and covered by a Protan Quality Inspection Patch to identify where tests have been executed.

When hand welding, a continuous pre-weld should be made at the back edge of the overlap prior to full welding. The weld is then completed giving a finished seam width of between 20 mm and 40 mm.

In all cases an uninterrupted extrusion of molten material should be visible along the seam.

On completion of the weld, the seam should be tested by running a metal probe down along the joint to check for total consolidation.

#### 2.6.4 Details

The Certificate holder supplies a range of preformed PVC rainwater outlets, PVC laminated metal and prefabricated PVC shapes to deal with parapet, edge, corner, rainwater outlet and drainage details.

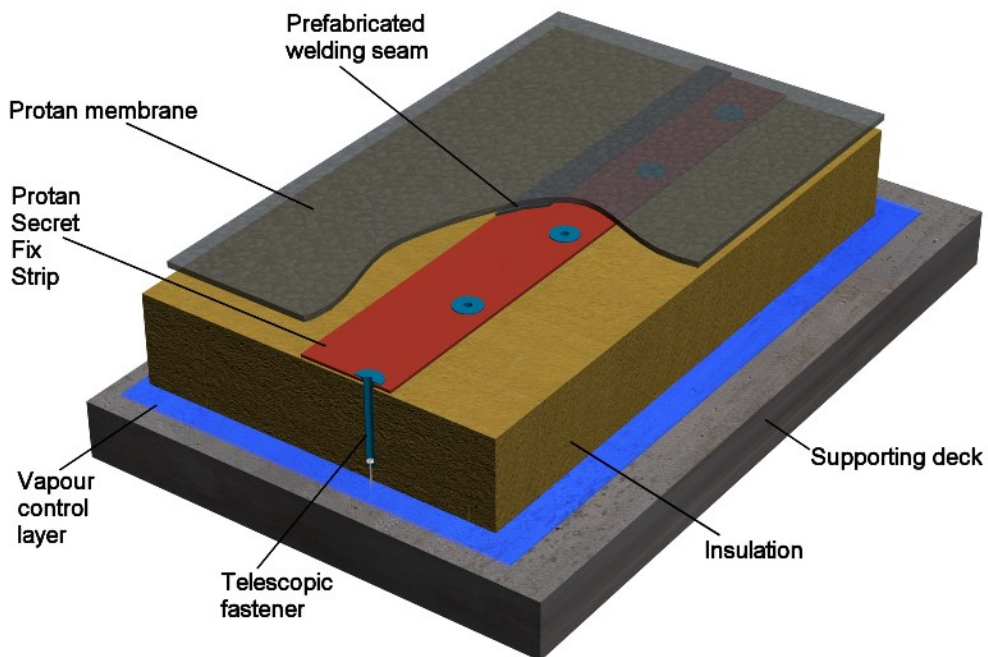


Figure 3 Protan Secret Fix System Detail

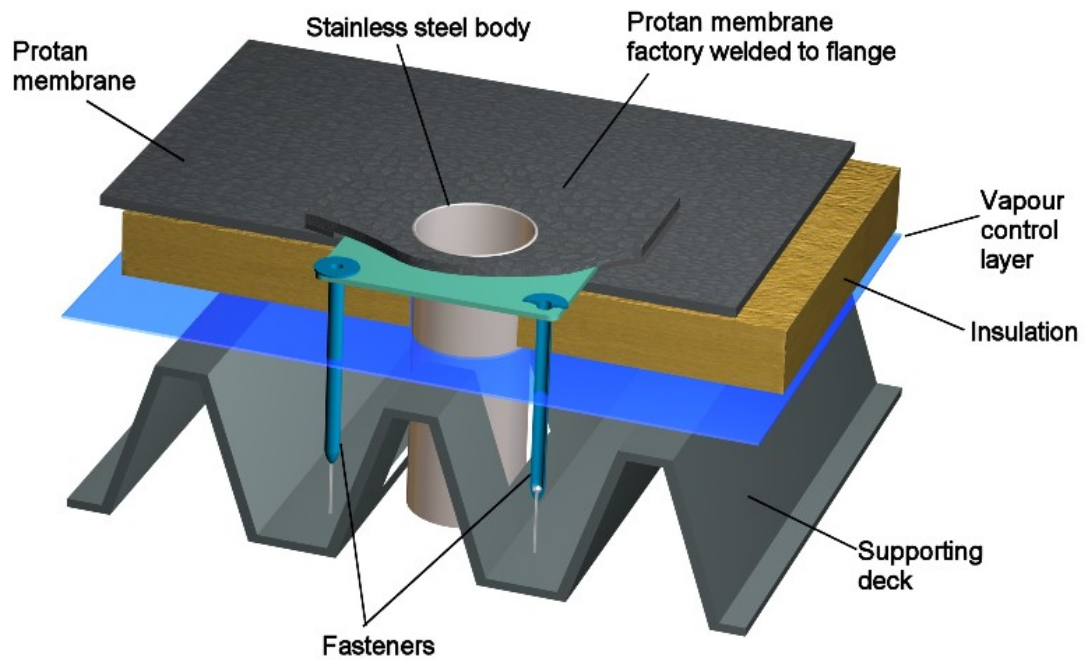


Figure 4 Outlet with Factory Attached Protan Membrane



**3 GENERAL**

- 3.1** Protan SE and EX roofing membranes when installed in accordance with the manufacturer's instructions are suitable for use on timber, metal, concrete or suitable insulated decks as a mechanically fixed waterproof covering on pitched or 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 in excess of this is envisaged, special precautions such as additional protection to the membrane must be taken as recommended by the manufacturer.
- 3.3** Flat roofs are defined for the purpose of this Certificate as those roofs up to 10° to the horizontal. To minimize ponding, and in accordance with BS 6229<sup>[5]</sup>, 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.
- 3.4** Section 4.1 (ii) of this certificate defined the fire rating of a Protan SE roofing system tested in the sloping position per BS 473: Part 3<sup>[9]</sup>. The designation of other roof systems should be confirmed by test or assessment. Pitched roofs are defined as those which slope at an angle of greater than 10° and up to 70° to the horizontal.
- 3.5** Decks to which the product is to be applied must comply with the relevant requirements of BS 8217<sup>[2]</sup> and BS 6229<sup>[5]</sup>.
- 3.6** Non-traditional insulation systems or materials used in conjunction with this product must only be used in accordance with the Certificate holder's instructions.
- 3.7** Protan SE and EX roofing membranes installed in accordance with the manufacturer's instructions can resist the effects of wind suction, thermal cycling and minor structural movements likely to occur in practice. See Clause 4.7 of this certificate.
- 3.8** The systems can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Reasonable care is required, however, to avoid puncture by sharp objects or concentrated loads. Anywhere regular traffic is envisaged, i.e. such as the maintenance of lift equipment, a walkway must be provided by Protan 2.4mm GT Terrace Grade walkway membrane or concrete slabs supported on Protan Pavepad.
- 3.9** A condensation risk should be assessed in accordance with BS 6229<sup>[5]</sup> and BS 5250<sup>[8]</sup> and only approved vapour barriers should be used.

#### 4.1 BEHAVIOUR IN FIRE

- (i) Results of tests indicate that a system comprising 0.7 mm profiled steel decking, 50 mm polyurethane insulation with an aluminium foil facing on the upper side and glass tissue facing to the underside, and one layer of Protan SE mechanically fixed, will be unrestricted, (achieved a EXT.F.AA rating).
- (ii) Results of tests indicate that a system comprising 0.7 mm profiled steel decking, 0.21 mm thick vapour control layer, 90 mm foil-faced polyurethane insulation, and one layer of Protan SE mechanically fixed can be classified under BS EN 13501-5<sup>[10]</sup> as B<sub>ROOF</sub> (t4), (achieved a EXT.S.AB rating).
- (iii) Results of tests indicate that a system comprising 0.7 mm profiled steel decking, 150 mm foil faced Kingspan TR26 PIR insulation, a polyethylene vapour control layer, and one layer of Protan SE mechanically fixed can be classified under BS EN 13501-5<sup>[10]</sup> as B<sub>ROOF</sub> (t4), (achieved a EXT.F.AB rating).
- (iv) Results of tests indicate that a system comprising an 18 mm plywood deck, 150 mm foil faced Kingspan TR26 PIR insulation, a polyethylene vapour control layer, and one layer of Protan SE mechanically fixed can be classified under BS EN 13501-5<sup>[10]</sup> as B<sub>ROOF</sub> (t4), (achieved a EXT.F.AB rating).

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

#### 4.2 THERMAL INSULATION

Calculations of the thermal transmittance (U-value) of specific roof build-ups should be carried out in accordance with IS EN ISO 6946<sup>[22]</sup> using a thermal conductivity ( $\lambda$ ) values of the products used as defined by the certificate holder. The U-value of a construction will depend on the materials used and the design.

For retrofit installations on existing dwellings guidance should be sought from the certificate holder on achievable U-values as the actual U-value of installation will depend on the construction of the existing building elements. Further guidance on thermal performance can be found in SR 54<sup>[23]</sup>.

The product can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings. Guidance in this respect, and on limiting heat loss by air infiltration, shall be sought from the certificate holder and by reference to the DoEHLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details*.

#### 4.3 CONDENSATION RISK

The interstitial and internal condensation risk of the roof should be assessed in accordance with BS 6229<sup>[5]</sup> and BS 5250<sup>[8]</sup>. An approved vapour control layer (AVCL) is required on the warm side of the insulation in all instances.

##### 4.3.1 Interstitial Condensation

The risk of interstitial condensation in the roof build-up is dependent on a number of factors including roof design. Reference should be made to BS 6229<sup>[5]</sup> and BS 5250<sup>[8]</sup>.

To avoid the risk of interstitial condensation in cold flat roofs, an AVCL should be provided on the warm side of the insulation and there should be a cross-ventilated void, not less than 50mm deep, between the slab or deck and the insulation. Ventilation openings shall be provided to every roof void along two opposite sides of the roof.

The risk of risk of interstitial condensation in warm flat roofs is dependent on the nature of the supporting structure. As there is a risk of interstitial condensation forming between the thermal insulation and the waterproofing covering, an AVCL with a vapour resistance at least equal to that of the waterproofing covering should be installed immediately above the supporting structure, wrapped and sealed at the perimeter and at all penetrations through the roof covering.

For inverted flat roofs, it is essential that the thermal insulation used resists water absorption and is sufficiently loadbearing to support the protective covering or ballast where used.

When building elements do not follow the principles of BS 5250<sup>[8]</sup>, a robust hydrothermal assessment to either I.S. EN 15026<sup>[26]</sup> or I.S. EN ISO 13788<sup>[27]</sup> must be considered.

Care should be taken to provide adequate ventilation, particularly in rooms expected to experience high humidity, and to ensure the integrity of vapour control layers and linings against vapour ingress.

#### **4.3.2 Internal Surface condensation**

For retrofit installation, when improving the thermal performance of the external envelope of an existing building, through to upgrading of roof insulation as part of a roof build-up, designers need to consider the impact of these improvements on other untouched elements of the building.

When bridged junctions meet the requirements of TGD Part L, Appendix D table D1, the coldest internal surface temperature will satisfy the requirements of section D2, namely that the temperature factor (fR<sub>si</sub>) shall be equal to or greater than 0.75. As a result, best practice will have been adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth.

When site limiting factors give rise to substandard level of insulation at bridged junctions, guidance should be sought from the certificate holder as to acceptable minimum requirements (see clause 4.4 for further guidance).

When insulating buildings, the recommendations of BS 5250<sup>[8]</sup> should be followed to minimise the risk of condensation within the building elements and structures.

Roofs will adequately limit the risk of surface condensation where the thermal transmittance (U-value) does not exceed 0.35 W/m<sup>2</sup> K for roofs at any point, and openings and junctions with other elements are designed in accordance with the DoEHLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details (ACD).

#### **4.4 LIMITING THERMAL BRIDGING**

The linear thermal transmittance  $\psi$  (Psi) describes the heat loss associated with junctions and around openings.

When all building junctions are shown to be equivalent or better than those detailed in the DoEHLG Acceptable Construction Details, then it is acceptable to use the linear thermal transmittance values outline in Table D1 of Appendix D of TGD to Part L of the Building Regulations 1997 to 2019. When all bridged junctions within a building comply with the requirements of Table D1 of appendix D of TGD to Part L, the improved 'y' factor of 0.08 can be entered into the Dwelling Energy Assessment Procedure (DEAP) Building Energy Rating (BER) calculation.

Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded for that project for use in future BER calculations.

$\Psi$ -values for other junctions outside the scope of this certificate should be assessed in accordance with the BRE IP1/06 "Assessing the effects of thermal bridging at junctions and around openings" and BRE Report BR 497<sup>[28]</sup> in accordance with appendix D of TGD to Part L of the Building Regulations 1997 to 2019.

#### **4.5 VENTILATION**

Adequate room and roof ventilation must be provided in accordance with TGD Part F of the Building Regulations 1997 - 2019, for all installations. This will also limit to potential for Interstitial Condensation Internal Surface as detailed in Cl. 4.3 of this certificate.

In addition, a cross-ventilation shall be provided in cold flat roof designs as detailed in Cl. 4.3.1 of this certificate.

#### 4.6 MAINTENANCE

Protan SE and EX roofing membranes when installed in accordance with this Certificate and the Certificate holder's instructions will have minimum need for maintenance. Drainage outlets and gutters should be regularly maintained.

In the event of damage, repair should be carried out in accordance with Protans' repair instructions. Repair consists of applying a Protan welding patch, diameter 110mm or 190mm or a manually fitted Protan SE patch, to extend at least 50mm beyond the defect. The damaged area should be thoroughly cleaned and the patch then hot-air welded.

#### 4.7 WEATHERTIGHTNESS

Assessment has shown that Protan SE and EX roofing membranes and joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building. Protan roofing systems are capable of accepting minor structural movements without damage and so meet the requirements of Part C of the Building Regulations 1997 to 2019.

#### 4.8 RESISTANCE TO WIND UPLIFT

The resistance to wind uplift of the mechanically-fastened Protan SE and EX membranes is provided by Protan fasteners passing through the membrane into the substrate. The number and position of fixings will depend on a number of factors including:

- wind uplift forces to be restrained
- pull-out strength of the fasteners
- tensile properties of the membrane
- appropriate calculation of safety factors.

The wind uplift forces are calculated in accordance with I.S. EN 1991-1-4<sup>[7]</sup>.

The Certificate holder offers a design service, which takes all the relevant supplied information into account, including calculations for the wind uplift affecting the roof, and provides a detailed written specification for the roof system. This specification will include the type of fasteners required and their fixing centres.

The Certificate holder takes liability for the calculations of their own design of the mechanically fastened system.

#### 4.9 EFFECTS OF TEMPERATURE

Protan Roof Waterproof Membranes will resist temperatures in the range of -30°C to 80°C.

#### 4.10 DURABILITY

When installed in accordance with this Certificate and adequately supported by the substrate, all available evidence indicates that Protan SE and roofing membranes should have a life in excess of 30 years.

Repairs carried out by Protan trained and registered contractors are effective in restoring weather tightness.

#### 4.11 TOXICITY

The membranes are not toxic in normal service.

#### 4.12 REUSE AND RECYCLABILITY

The products comprise PVC, which can be recycled.

#### 4.13 RESISTANCE TO FOOT TRAFFIC

Results of test data indicate that the membranes can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Care must be taken to avoid puncture by sharp objects, or concentrated loads. On limited access roofs where excessive traffic is envisaged, such as maintenance of lift equipment, a walkway must be provided, for example, using concrete slabs supported on bearing pads.

#### 4.14 OTHER INVESTIGATIONS

- (i) The manufacturing process was examined including methods adopted for quality control, and details were obtained of the quality and composition of the materials used. In addition, a range of product testing was witnessed.
- (ii) NSAI carried out visits to assess the history of use and practicability of installation of the product. The Protan and Colas training facilities were also visited.
- (iii) A visit was made to a site in progress to assess the method of application of the system.
  - (i) Test data on the following properties was also examined: See table 2 for details.
    - Joint peel and shear strength
    - Wind uplift
    - Tensile, elongation and tear tests
    - Water vapour permeability and resistance
    - Flexibility at low temperatures

**Table 3: CE Marking Declared Values \***

Test	Protan SE Membrane			Protan EX Membrane	
	1.2	1.6	1.8	1.2	1.6
<b>Reaction to Fire</b>	Class E	Class E	Class E	Class E	Class E
<b>Watertightness (10kPa)</b>	Pass	Pass	Pass	Pass	Pass
<b>Tensile properties (N.50mm<sup>-1</sup>)</b>					
- <b>Longitudinal</b>	≥ 1100	≥ 1100	≥ 1100	≥ 1100	≥ 1100
- <b>Traverse</b>	≥ 1050	≥ 1100	≥ 1100	≥ 1100	≥ 1100
<b>Elongation L/T (%)</b>	≥ 15	≥ 15	≥ 15	≥ 15	≥ 15
<b>Resistance to impact (mm)</b>	≥ 400	≥ 600	≥ 700	≥ 400	≥ 600
<b>Resistance to static loading (kg)</b>	≥ 20	≥ 20	≥ 20	≥ 20	≥ 20
<b>Tear resistance (N.50mm<sup>-1</sup>)</b>	≥ 210	≥ 210	≥ 210	≥ 300	≥ 300
<b>Joint peel resistance, max (N.50mm<sup>-1</sup>)</b>	≥ 200	≥ 200	200	≥ 200	≥ 200
<b>Failure mode</b>	C	C	C	C	C
<b>Joint shear resistance (N.50mm<sup>-1</sup>)</b>	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000
<b>Foldability at low temp (°C)</b>	≤ -30	≤ -30	≤ -25	≤ -30	≤ -30
<b>Exposure to UV</b>	Pass > 5000h	Pass > 5000h	Pass > 5000h	Pass > 5000h	Pass > 5000h
<b>Dangerous substances</b>	None	None	None	None	None

\* Values for the membranes essential characteristics are given in the manufacturer's declaration of performance (DoP). Designers should refer to the latest version of the manufacturers DoP for all essential characteristic values.



#### **4.15 CE MARKING**

The Certificate holder has taken responsibility of CE marking the product in accordance with Harmonised European Standard EN 13956<sup>[1]</sup>. An asterisk (\*) appearing in this Certificate indicates that data shown is given in the manufacturers declaration of performance (DoP). See Table 3. Designers should refer to the latest version of the manufacturers DoP for all essential characteristics.

- 5.1** National Standards Authority of Ireland ("NSAI") following consultation with the NSA 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 2019 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 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. 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.

## NSAI Agrément

This Certificate No. **06/0262** is accordingly granted by the NSAI to **Protan AS** on behalf of **NSAI Agrément**.

Date of Issue: **November 2006**

Signed



**Seán Balf**  
**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 Business Park, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. [www.n sai.ie](http://www.n sai.ie)

### Revisions:

- **February 2007:** To add fire test data for the product in the sloping position.
- **June 2016:** Removal of EXG membrane. References to Irish Building Regulations and standards updated. Product listing and specification updated to reflect manufacturers DoP.
- **03<sup>rd</sup> June 2021:** General revision.



## Bibliography

- [1] I.S. EN 13956:2012: *Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - definitions and characteristics*
- [2] BS 8217:2005 *Code of practice for Reinforced bitumen membranes for roofing.*
- [3] I.S. EN ISO 9001:2015: *Quality Management Systems – Requirements.*
- [4] BS 8747:2007: *Reinforced bitumen membranes (RBMs) for roofing – Guide to selection and specification.*
- [5] BS 6229:2018 *Code of practice for flat roofs with continuously supported coverings.*
- [6] BS 8000-4:1989: *Workmanship on Building sites – Code of practice for waterproofing,*
- [7] I.S. EN 1991-1-4: 2005+A1:2010: *Actions on Structures. Wind Action.*
- [8] BS 5250:2011+A1:2016: *Code of practice for control of condensation in buildings.*
- [9] 476: Part 3:2012: *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs.*
- [10] EN 13501-5: 2016: *Fire classification of constructional products and building elements, Part 5 - Classification using data from external fire exposure to roof tests.*
- [11] S.R. CEN/TS 1187: 2012: *Test method for external fire.*
- [12] EN1928:2000: *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of watertightness.*
- [13] EN 12311-1: 2000: *Flexible sheets for waterproofing - Part 1: Bitumen sheets for roof waterproofing -Determination of tensile properties.*
- [14] EN12730:2015: *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to static loading.*
- [15] EN12691:2018: *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to impact.*
- [16] EN 12310-1:2000: *Flexible sheets for waterproofing - Part 1: Bitumen sheets for waterproofing - Determination of resistance to tearing (nail shank).*
- [17] EN 12317-1:2000: *Flexible sheets for waterproofing - Part 1: Bitumen sheets for roof waterproofing -Determination of shear resistance of joints.*
- [18] EN1296:2000: *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roofing - Method of artificial ageing by long term exposure to elevated temperature.*
- [19] EN1110:2010: *Flexible sheets for waterproofing - Bitumen sheets for roof waterproofing - Determination of flow resistance at elevated temperature.*
- [20] EN1109:2013: *Flexible sheets for waterproofing - Bitumen sheets for roof waterproofing - Determination of flexibility at low temperature.*
- [21] EN1850-1:2000: *Flexible sheets for waterproofing - Determination of visible defects - Part 1: Bitumen sheets for roof waterproofing.*
- [22] IS EN ISO 6946:2017: *Building components and building elements – Thermal resistance and thermal transmittance – Calculation method.*
- [23] SR 54:2014 & A1:2019: *Code of Practice for the energy efficient retrofit of dwellings.*
- [24] I.S. EN ISO 9001:2015: *Quality Management Systems – Requirements.*
- [25] I.S. EN ISO 14001:2015: *Environmental Management Systems - Requirements with guidance for use.*
- [26] I.S. EN 15026:2007: *Hygrothermal Performance of Building Components and Building Elements - Assessment of Moisture Transfer by Numerical Simulation.*
- [27] I.S. EN ISO 13788: 2012: *Hygrothermal performance of building components and building elements - internal surface temperature to avoid critical surface humidity and interstitial condensation - calculation methods.*
- [28] BRE Report BR 497: 2016: *Conventions for calculating linear thermal transmittance and temperature factors.*