

**IRISH AGRÉMENT BOARD
CERTIFICATE NO. 24/0442**

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Paralon Roof Waterproofing Systems

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with TGD Part D of the second schedule of the **Building Regulations 1997 and 2023**.



PRODUCT DESCRIPTION:

This Agrément Certificate relates to the Paralon Roof Waterproofing system comprising a range of polyester and glass fibre reinforced, APP and SBS modified bitumen membranes.

USE:

This Certificate covers the use of the Moy Materials Ltd range of Paralon roofing membranes as fully or partially bonded, two-layer waterproofing systems on flat, zero fall and pitched roofs with limited access. The Systems are intended for use with substrates in accordance with the BS 8217:2005^[13] and for all normal roofing details such as parapets, outlets and roof lights. The Moy Materials waterproofing membranes are manufactured to meet the requirements of IS EN 13707:2013^[1].

MANUFACTURE AND MARKETING:

The product is manufactured by:

IMPER ITALIA SRL.
Via Rita Atria 9,
10079 Mappano,
Torino, Italy
Tel: 00 38 011 2225499 Fax: 00 39 011 2621621
Email: export@imper.it
Web: www.imper.it

The product is marketed in Ireland by:

Moy Materials Ltd.
Unit K – South City Business Park,
Whitestown Way, Tallaght,
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1.1 ASSESSMENT

In the opinion of NSAI Agrément, The Moy Materials Ltd range of Paralon roof waterproofing systems, installed in Ireland by trained, experienced authorised installers in accordance with processing specifications issued by Moy Materials Ltd and used in the context of this Certificate, can meet the requirements of the Irish Building Regulations 1997 to 2023 as listed in section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2023 REQUIREMENT:

Part A – Structure A1 – Loading

Part B – Fire Safety Volume 1 - B4 – External Fire Spread Volume 2 - B9 – External Fire Spread

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

Part D – Materials and Workmanship D1 – Materials and Workmanship D3 – Proper Materials

Moy Materials Ltd, Paralon Roof Waterproofing Systems are comprised of 'proper materials', i.e. materials which are fit for their intended use and for the conditions in which they are to be used.

Part F – Ventilation F2 – Condensation in Roofs

Part L – Conservation of Fuel and Energy L1 - Conservation of fuel and energy

2.1 PRODUCT DESCRIPTION

This certificate relates to the Paralon Roof Waterproofing products comprising a range of polyester and glass fibre reinforced, APP and SBS modified bitumen membranes. Products include:

- Paralon ARD/HS a polyester reinforced polymer-modified bitumen membrane with a lower surface finish of thermofusible film and upper surface finish of slate granules.
- Paralon ARD/S a polyester reinforced polymer-modified bitumen membrane with a lower surface finish of thermofusible film and upper surface finish of slate granules.
- Paralon NT4 a polyester reinforced polymer-modified bitumen membrane with a lower surface finish of thermofusible film and upper surface finish of sand.
- Top S3 is a polyester reinforced polymer-modified bitumen membrane with a lower surface finish of thermofusible film and upper surface finish of sand or thermofusible film.
- Top N3 is a glass fibre reinforced polymer-modified bitumen membrane with a lower surface finish of thermofusible film and upper surface finish of sand or thermofusible film.

2.2 ANCILLARY ITEMS

- Imper Italia AVCLs (eg: Vapobar 1) – a range of self-adhesive and traditional polymer-modified bitumen AVCLs, reinforced with either polyester or glass fibre and/or a foil core, with a thickness range of 2mm to 4mm.
- Paratherm T a polyisocyanurate (PIR) insulation board with a lower surface finish of mineral coated glass fibre tissue and upper surface finish of bitumen coated glass fibre tissue with a thermofusible polypropylene fleece, available flat or in falls.
- Paratherm G a polyisocyanurate (PIR) insulation board with glass-tissue facings on both sides, available flat or in falls.
- Paratherm F a polyisocyanurate (PIR) insulation board with laminated foil facings on both sides, available flat or in falls.
- Moy Mineral wool flat roof slab range, a high density rock mineral wool roof insulation slabs with minimum compressive strength of 70kPA, with an appropriate fleece facing for the application, available flat or in falls.
- Impertene Bituminous Primer or approved alternative, solvent or water based bituminous primer for use on cementitious, metal and timber substrates, applied by either brush or roller.

Other items or components which may be used with the system, but which are outside the scope of this certificate include:

- Solvent or water-based, solar reflective paint, for use in protecting the waterproofing membranes from sunlight and other environmental factors.
- Cementitious board – an optional insulation or deck cover board, for improved construction, structural and fire performance of the system (contact the Certificate holder for suitable materials and minimum thicknesses)
- Various mechanical fasteners (including countersunk plate) – minimum 50 by 50 mm square or 50 mm diameter circular plate countersunk washers, for use in securing insulation boards to the substrate. Appropriate MOY thermally broken sleeves and suitable screw fasteners may also be used.
- Angle fillet – an insulated profile for use at upstands and kerbs above the insulation boards to aid formation of membrane edge details.
- MOY PU insulation adhesive.
- MOY hot bitumen bonding compound.
- Moulded accessories.
- Formed aluminium or GRP roof trims.
- Rainwater outlets.

2.3 MANUFACTURE

The reinforced bitumen sheets for roof waterproofing are manufactured in accordance with the requirements of IS EN 13707:2013^[1].

2.4 Quality Control

Quality control checks are carried out on the incoming raw materials, during production and on the finished product, refer to the harmonised standard Annex B Table B.1 IS EN 13707:2013^[1].

The management systems of the manufacturer Imper Italia have been assessed and registered as meeting the requirements of ISO 9001:2015^[20].

2.5 DELIVERY, STORAGE AND MARKING

Moy Materials Ltd Roof waterproofing products are supplied palletised in rolls shrink wrapped in UV-protective polyethylene. Each roll carries a label bearing the CE Marking together with the product description, product characteristics, size, thickness, batch number, date of manufacture, manufacturers name, NSAI Agrément identification mark and NSAI Agrément Certificate number for the system.

The rolls must be stored upright under cover on a clean surface. Do not stack them. Protect material from heat, direct sunlight and temperature extremes.

The bitumen rolls must not be exposed to solvents or other chemicals.

Adequate protection and safety precautions should be taken when the products are being fitted on site. Refer to the manufacturer's material safety data sheet.

Product	Thickness (mm)	Roll Length (m) **	Roll width (m)	Weight (Kg/m ²)	Roll Weight (Kg)	Reinforcement
Paralon ARD/HS	4*	8	1	5.1	40.8	Polyester
Paralon ARD/S	**	8	1	4.5	36	Polyester
Paralon NT4	4	8	1	4.0	32	Polyester
Top S3	3	10	1	3.0	30	Polyester
Top N3	3	10	1	3.0	30	Glass mat
*Excluding Chippings ** Not declared						

2.6 DESIGN AND INSTALLATION

2.6.1 General

The Paralon Roof Waterproofing membranes are to be installed by trained installers in accordance with the procedures in the dedicated Installation Manual^[26].

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.

For design purposes, the product may be assumed to have an allowable compressive strength as detailed in the client's applicable DOP (Declaration of Performance).

BS 8747:2007^[21] 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. Reference should also be made to SR54:2014&A2:2022^[22] where applicable.

Roof decks to which the covering is applied, must comply with BS 6229: 2018^[8].

The Paralon 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. Paralon roof waterproofing systems should be laid on dry substrates. Consult the manufacturers installation

guidelines with respect to drying substrates after rainfall.

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

All installation work must be carried out by suitably trained, experienced, authorised installers carrying the relevant insurance for such activity.

Reference should be made to the relevant parts of Section 2 to 4 of this certificate (NSAI Agrément Certificate 24/0442) and the Certificate Holders installation manual^[26] regarding the application of the Paralon ARD/HS, ARD/S, NT4, TOP/S and TOP/N bitumen roof waterproofing membranes as part of a complete roof build-up, including the following:

Preparation

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, crickets etc. must be complete and satisfactory. Necessary safety precautions must be followed including correct personal protective equipment (PPE) and hot works permits.

Air and Vapour Control Layer (AVCL)

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

The air and 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 50mm 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 air and vapour control layer should be sealed using bonding or taping methods as per the certificate holder's instructions.

Insulation

Insulation materials should comply with the BS 8217:2005^[13] or be the subject of a current NSAI Agrément Certificate suitable for this application. The compatibility of the insulation material and the Paralon 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, mechanically fixed or bonded as required to resist wind loading determined in accordance with the requirements of I.S. EN 1991-1-4:2005^[10].

To prevent moisture being trapped on, or in the insulation it is essential to protect the boards during laying, before the application of the roof waterproofing, or to lay the roof covering at the same time as laying the boards. However, boards accidentally wetted, must be replaced or allowed to dry fully before application of the waterproof layer. Insulation boards should be installed only when the ambient temperature is above 5°C to prevent condensation.

Insulation boards can be cut with a sharp knife or fine-toothed saw to fit around projections through the roof. The polyisocyanurate (PIR) insulation boards are combustible and must be protected from naked flames and other ignition sources during and after installation.

For fully bonded insulation applications, the installed boards shall be bonded to the AVCL using hot bitumen (maximum temperature 240°C) or a suitable polyurethane adhesive recommended by the certificate holder.

A comprehensive U-value calculation and condensation risk analysis should be carried out for all projects in accordance with the appropriate Building standards.

Substrate

Timber decking must be dry and free from wane, pitch pockets, decay and insect attack. Decks should be designed in accordance with the relevant clauses of BS 6229: 2018^[8] or other approved design guides.

On concrete, care should be taken to ensure that the concrete deck is graded to the correct falls, dry, clean and free from any projections or gaps.

Industry typical practice guides a curing period of 28 days typically. However, this period may be lengthened or shortened subject to the design of any particular concrete mix, therefore the advice of the mix designer should take precedence in determining the appropriate curing period. Concrete placed into profiled metal liners will usually require extended curing times. Practical tests such as fastener pull-out testing and/or peel resistance testing may be employed to determine the adhesion between the waterproofing system and the slab.

On metal decks the boards are laid either with the long axis at right angles to the corrugations of the metal deck or diagonally across the corrugations of the deck, ensuring that all end joints and corners are sufficiently supported on the crown flats of the decking. The thickness of the board to be used is dependent on the width of the trough openings of the metal deck.

Fixings

The specification for fixing boards will vary with the location, roof height/area and topographical data. The number of fixings per board and fixing layout shall be covered under the roof design.

Generally, for mechanically fastened insulation applications, fixings must incorporate a minimum 50mm by 50mm square or 50mm diameter circular plate countersunk washer, which must not restrain more than one board. Appropriate MOY thermally broken sleeves and suitable screw fasteners may also be used. The fastener or system supplier shall define the minimum number of fixings to be used per square meter with the requirement for additional fixings assessed in accordance with I.S. EN 1991-1-4: 2005^[10]. All fixings shall be placed within the individual board area and sited more than 50 mm but less than 150 mm from the edges and corners of the board. Additional fixings around the roof perimeter may also be required.

Membrane

Installation of the Paralon ARD/HS, ARD/S, NT4 and Top S/ Top N roof waterproofing systems is carried out using traditional methods of laying bituminous felts, to meet the requirements of BS 8000-4:1989^[23], BS 8217:2005^[13] and the certificate holders instructions.

The authorised installer should plan the cap sheet starting point and sheet patterns before commencing works. Side laps of minimum 80-100mm and end laps of minimum 150mm. 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. Both longitudinal and traversal joints are staggered from the underlay joints as detailed in BS 8217:2005^[13], Figure 17.

Install night seals as appropriate to avoid water ingress during installation.

Fully bonded applications

Bonding is achieved by heating the lower thermofusible film surface by torching and pressing the membrane down. The width of molten mixture must not exceed 10-20mm (bleed width). Care must be taken not to overheat the membrane. A propane gas torch is

used to ensure total adhesion is achieved. During the laying, excessive heating must be avoided.

All side laps must be a minimum 80 -100 mm and end laps must be a minimum 150 mm. A bead of molten material must extrude from all laps to indicate a satisfactory seal.

Detailing at expansion joints, upstands, roof edges and gutters should be performed in accordance with the requirements of BS 8217:2005^[13] and the certificate holders' instructions.

Surface Finishes can include pavers or well-rounded stone ballast where applicable. The advice of the certificate holder should be sought in this regard. Reference should be made to the requirements of BS 8217:2005^[13] regarding the installation of surface protection.

This Certificate does not contain a full set of installation instructions, but an overview of the procedures involved. For a full list of these instructions, refer to the Certificate holder's installation manual ^[26].

Figure 1: Paralon Typical Roof Build-up

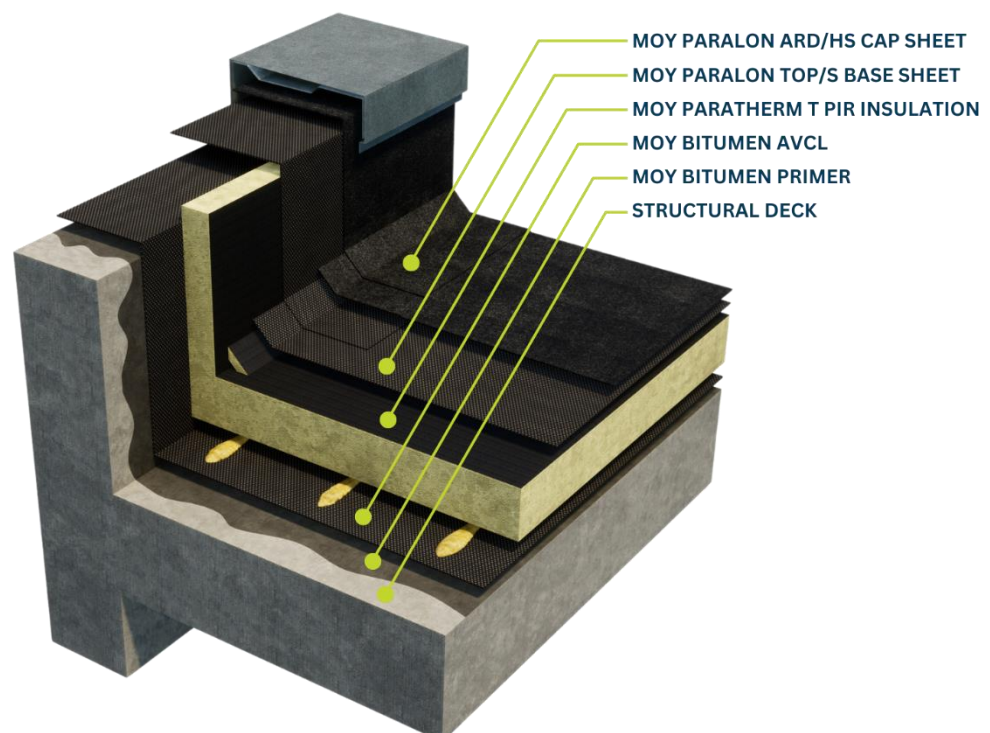
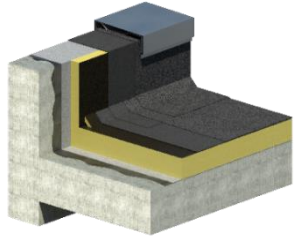
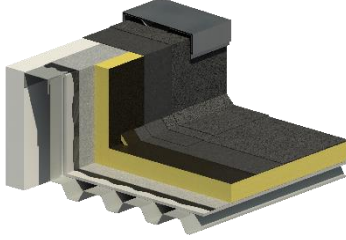
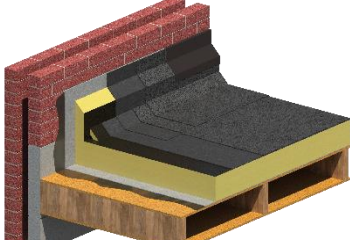


Table 2: Typical Roof Build-ups

System	- New Build over concrete Deck ¹ - Refurbishment options ²	- New Build over Steel Deck ¹ - Refurbishment options ²	- New Build over Timber Deck ¹ - Refurbishment options ²
Build Up			
Substrate	Concrete + appropriate Moy Primer (As applicable)	Steel + appropriate Moy Primer (As applicable)	Timber + appropriate Moy Primer (As applicable)
Cap Sheet Options	Paralon ARD/HS Paralon ARD/S Paralon NT4	Paralon ARD/HS Paralon ARD/S Paralon NT4	Paralon ARD/HS Paralon ARD/S Paralon NT4
Fastening of Cap Sheet	Fully bonded by torching	Fully bonded by torching	Fully bonded by torching
Base Sheet Options	TOP/S TOP/N	TOP/S TOP/N	TOP/S TOP/N
Fastening of Base sheet	Fully bonded by torching	Fully bonded by torching	Fully bonded by torching
Cover Board (optional)	Optional cover board	Optional cover board	Optional cover board
Fastening of cover board	- Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings	- Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings	- Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings
Insulation	Paratherm T, Paratherm G, Paratherm F PIR, as appropriate (depending on application)	Paratherm T, Paratherm G, Paratherm F PIR, as appropriate (depending on application)	Paratherm T, Paratherm G, Paratherm F PIR, as appropriate (depending on application)
Fastening	MOY Mineral Wool - Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings	MOY Mineral Wool - Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings	MOY Mineral Wool - Bonded with MOY PU Adhesive, or Bitumen - Mechanically fixed with MOY approved fixings
AVCL Options	MOY range of traditional reinforced bitumen air and vapour control layers. Available with or without aluminium foil lining, ranging between 2mm – 4mm in thickness.	MOY range of traditional reinforced bitumen air and vapour control layers. Available with or without aluminium foil lining, ranging between 2mm – 4mm in thickness.	MOY range of traditional reinforced bitumen air and vapour control layers. Available with or without aluminium foil lining, ranging between 2mm – 4mm in thickness.
Fastening	Fully bonded by torching	Fully bonded by torching	Fully bonded by torching
AVCL Options (Self-adhesive)	MOY range of self-adhesive reinforced modified bitumen air and vapour control layers. Available with or without aluminium foil lining or facings. Self - adhered	MOY range of self-adhesive reinforced modified bitumen air and vapour control layers. Available with or without aluminium foil lining or facings. Self - adhered	MOY range of self-adhesive reinforced modified bitumen air and vapour control layers. Available with or without aluminium foil lining or facings. Self - adhered
Fastening			
Substrate Board (Optional)	Not Applicable	Optional substrate board	Not Applicable

Notes:

¹ The above table is only intended for general guidance purposes only. A project specification should always be produced in conjunction with the certificate holder to ensure all project requirements are fully considered.

² Paralon bitumen roofing systems are also suitable for use in refurbishment applications, subject to assessment of the existing roof. This may require partial or full stripping of some or all of the existing layers. A roof survey and condition report would typically be necessary to allow a project specification to be produced by the certificate holder stating the appropriate recommendations.

3.0 STRENGTH AND STABILITY

3.1 Paralon roof waterproofing systems, when installed in accordance with this certificate and the manufacturer's instructions, are suitable for use on insulated decks, concrete, timber or metal decks as:

- (a) A fully double layer waterproof covering on pitched roofs with limited access.
- (b) A fully bonded double layer Waterproof covering on flat roofs with limited access.

3.2 Paralon roof waterproofing membranes are also suitable for use as a waterproof covering ballasted with aggregate to prevent wind uplift, on flat roofs with limited access.

3.3 Paralon roof waterproofing membranes are also suitable for use where appropriate, as an exposed cap-sheet or in detailed work.

3.4 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^[13] clause 8.19.

Other decorative finishes are available in areas such as accessed roof terraces and roof gardens see BS 8217:2005^[13] clause 5.5 *Surface finishes* for further information.

3.5 Insulation materials should comply with BS 8217:2005^[13] or be the subject of a current NSAI Agrément Certificate, provided that nothing in the Certificate prevents the use of Paralon 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 holders instructions.

When profiled decking is used, the insulation product will need to span across the ribs. The Certificate holder should be contacted for guidance on the maximum permissible spans between ribs for the different product thicknesses.

3.6 Flat roofs are defined for the purpose of this Certificate as those roofs up to 10° to the horizontal. Pitched roofs are defined as those

which slopes at an angle of greater than 10° and up to 70° to the horizontal.

3.7 To minimize ponding, and in accordance with BS 6229:2018^[8], 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.

Although the Paralon roof waterproofing membranes 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.

Zero fall roofs are defined for the purpose of this certificate as those having a finished fall of between 0 and 1:80. For zero fall roofs it is particularly important to identify the correct drainage system to ensure that it is effective. Reference should also be made to the appropriate clauses in BS 6229:2018^[8].

3.8 The Paralon Roof Waterproofing Products have not been assessed for use with permanent distributed or concentrated loads, such as air conditioning units, mechanical plants, water tanks, etc. Such loads should be supported directly on the roof structure. All plant to be installed on appropriately designed plant plinths or support systems.

3.9 When installed in accordance with this Certificate, and the manufacturer's instructions, the Paralon Roof Waterproofing membranes, and the joints in the membranes, when completely sealed and consolidated will adequately resist the passage of moisture and the effects of wind suction, elevated temperatures and thermal shock conditions likely to occur in practice.

3.10 The resistance to wind uplift depends on many factors specific to each project. The effect of wind loading should be calculated in accordance with IS EN 1991-1-4:2005^[10] and the Irish national Annex using the appropriate basic wind speed shown on the map in Diagram 1 of Technical Guidance document (TGD) Part A of the Building Regulations.

The roof construction must be structurally sound and have sufficient strength and stability to resist all dead, imposed and wind loads. It must also have adequate resistance to the pull-out forces created by the wind forces acting on the specified fixings used.

The suitability of the substrate to accept the adhesive bond or mechanical fixings must be established before installation. Mechanical fixings must be checked before installation by carrying out in-situ pull-out or pull-through tests to determine the minimum safe working load the fixings can resist. The advice of the Certificate holder should also be sought in respect of the type and number of fixings to be used.

When installed on suitable flat roof decks, using appropriate fixings and/or adhesive, the product can adequately transfer designed loads.

For the adhesive-bonded application, the substrate must be free of dust and dry, and the installation must be in accordance with the instructions of the adhesive manufacturer. The

surface of the substrate must have sufficient cohesive strength to resist the calculated wind load acting upon the structure.

When adhering is the chosen method for the insulation or waterproofing, adhesion between the insulation product and AVCL, and between the product and overlay, must be adequate to resist the effects of wind suction and thermal cycling likely to be experienced under normal conditions.

In areas where high wind speeds can be expected, additional mechanical fixings should be considered, and the advice of a suitably qualified Chartered Engineer should be sought as to the method of fixing as defined in the relevant clauses of I.S. EN 1991-1-4:2005^[10].

Figure 2: Paralon Rainwater Outlet detail

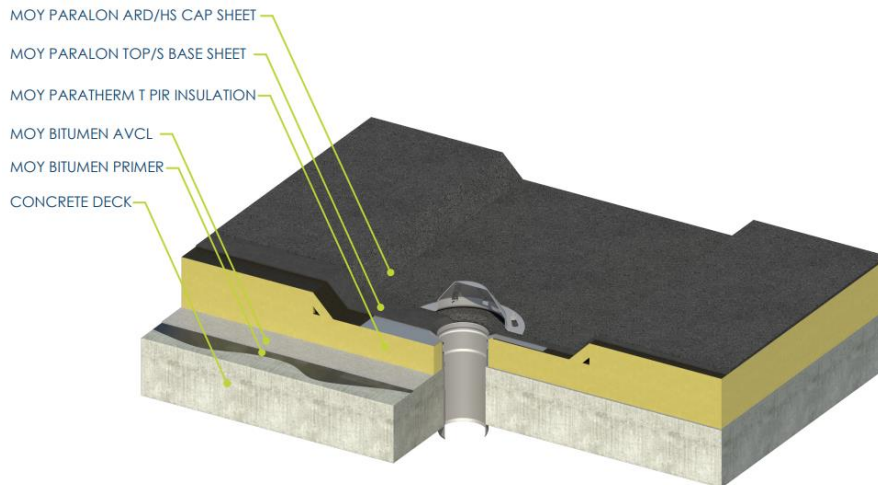
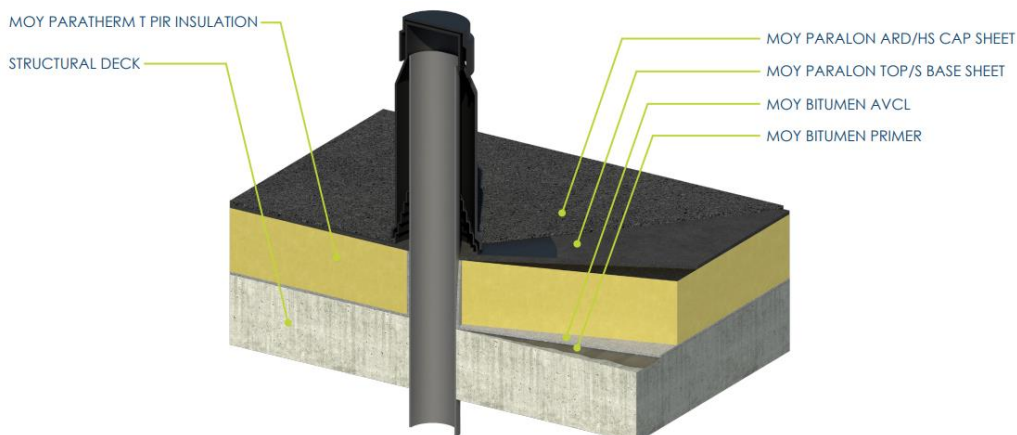


Figure 3: Paralon Vent pipe penetration detail



4.1 BEHAVIOUR IN FIRE

Refer to the Certificate Holders DoP (Declaration of Performance) for the declared Reaction to Fire classifications for the Roof waterproofing systems products.

The resistance to fire exposure of a built-up roofing system will be dependent on the fire performance of the combined individual components and cannot be predicted from the classification of the membrane and insulation alone. The classification of a specific roof system must be confirmed by reference to the requirements which fulfil the "external fire performance" Technical Guidance Document Part B, Appendix A, Table A5 of the Irish building Regulations.

When tested in accordance with IS EN 13501-5: 2016^[24], from submitted fire test reports a system comprising:

Paralon ARD/HS cap sheet and Paralon TOP/S Base layer

18 mm OSB/3, steel deck or concrete supporting deck, primer, bituminous vapour control layer, 35mm or more thickness of Paratherm T (PIR) insulation board, Paralon TOP/S 3mm reinforced bitumen underlay and Paralon ARD/HS top layer 4mm SBS bitumen waterproofing membrane, can be classified as B_{ROOF} (t4) in accordance with I.S. EN 13501-5^[24].

The fire test report achieved a B_{ROOF} (t4) classification per I.S. EN 13501-5: 2016^[24], when evaluated against S.R. CEN/TS 1187: 2012^[25].

The designation of other roof build-ups should be confirmed by test or assessment.

When using the Paralon roofing membranes on flat roofs 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.

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 6946:2017^[11] and BRE Report BR 443^[15] using a thermal conductivity (λ) value 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.

The U value of a completed roof will depend on the thickness of insulation used, the number and type of fixings and the insulating value of other roof components/layers.

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.

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

Condensation risk should be assessed in accordance with BS 6229:2018^[8] and BS 5250:2021^[6], only approved vapour barriers should be used. Roofs should incorporate an AVCL below the insulation that is compatible both with the insulation and the waterproofing system. Advice should be sought from the Certificate holder.

To minimise moisture entering the roof, the AVCL shall have sealed and lapped joints and must be turned up around the insulation or sealed to the waterproofing finish. The Certificate holder should be contacted for the purpose of calculating a project specific condensation risk analysis.

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 6229:2018^[8] and BS 5250:2021^[6], and only approved vapour barriers should be used.

Cold roofs present a higher risk of harmful interstitial and surface condensation forming on the underside of the plywood decking and dripping onto the upper side of the insulation. Therefore, this type of roof is no longer recommended because of the difficulty of forming and maintaining an effective AVCL below the insulation and providing sufficient cross-ventilation above the insulation. If this type of roof build-up cannot be avoided, the cross ventilated void should not be

less than 50mm deep and the opening width should not exceed 5 metres apart. Mushroom vents have proven not to be effective.

A fully waterproof breather membrane should also be installed in all cold roof systems on the cold side of the thermal insulation, taped and sealed to manufacturer's instructions. The breather membrane should be vapour permeable, rather than air-permeable, and should allow water vapour to pass through it while providing a barrier to air, thereby minimising energy losses.

The 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 5250:2021^[6], a robust hygrothermal risk assessment to either I.S. EN 15026:2023^[18] or I.S. EN ISO 13788:2012^[17] 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.

The Roof waterproofing Products referred to in this Certificate are unlikely to be affected by surface or interstitial condensation, provided the system is installed in accordance with the Certificate holders instructions.

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 (fRsi) 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 5250:2021^[6] 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) meets the requirements of TGD Part L, 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 ψ (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. 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.

Ψ -values for other junctions outside the scope of this certificate should be assessed in accordance with the BRE report IP1/06^[3] and BRE Report BR 497^[4] in accordance with appendix D of TGD to Part L of the Building Regulations. All values to be verified by a suitably qualified assessor.

4.5 VENTILATION

Adequate room and roof ventilation must be provided in accordance with TGD Part F of the Building Regulations, for all installations. This will also limit to potential for Interstitial Condensation Internal Surface as detailed in Cl. 4.3.1 of this certificate.

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

4.6 MAINTENANCE

Installed Paralon Roof waterproofing Systems must be the subject to inspections and maintenance at least twice yearly to ensure continued performance as detailed in BS 8217:2005^[13] clause 10 and BS 6229:2018^[8] section 7 "*Care and Maintenance*". Maintenance should include checks and operations to ensure the following where applicable:

- Protection layers are in good condition
- Exposed membrane is free from the build-up of silt, and other debris and unwanted vegetation are cleared.
- Clearance of rainwater outlets, downpipes and gutters should be regularly maintained.
- Where applicable adequate ballast is in place and evenly distributed over the membrane.
- After all storm events.

In the event of accidental damage, repair should be carried out by a licensed Moy Materials contractor in accordance with the certificate holder's instructions. When maintenance of the roof waterproofing is required, protective boarding should be laid over the roof surface to avoid concentrations of loads. A detailed log should be maintained of any maintenance works carried out.

4.7 WEATHERTIGHTNESS

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

4.8 RESISTANCE TO WIND UPLIFT

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

4.9 DURABILITY

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

Repairs can be carried out by the procedures listed in section 4.6 and are effective in restoring weather tightness.

4.10 TOXICITY

The membranes are not toxic in normal service.

4.11 REUSE AND RECYCLABILITY

The Paralon roof waterproofing membranes are made from bitumen and polyester that can be recycled.

4.12 RESISTANCE TO FOOT TRAFFIC

The system can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, such as maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads or manufacturer's walkway sheets). Reasonable care must be taken to avoid puncture of the membranes by sharp objects or concentrated loads.

4.13 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) NSAI carried out site visits in Ireland to assess the history of use and practicability of installation of the product.

4.14 CE MARKING

The manufacturer has taken responsibility of CE marking the Paralon Roof Waterproofing Products in accordance with Harmonised European Standard *I.S. EN 13707:2013*^[1]. The NSAI assessment was performed against the manufacturers Declaration of Performance (DoP) listed in the bibliography, which should be referenced for the essential characteristic values of the Paralon ARD/HS, ARD/S, NT4, Top S3 and Top N3 products assessed.

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 latest revision so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI are paid.

5.2 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, 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. **24/0442** is accordingly granted by the NSAI to Moy Materials Ltd on behalf of NSAI Agrément.

Date of Issue: 24th July 2024

Signed



Kevin D. Mullaney
Director of Certification, NSAI

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

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