

Dryvit UK Ltd

Unit 4 Wren Park
Hitchin Road
Shefford
Bedfordshire SG17 5JD

Tel: 01462 819555 Fax: 01462 819556

e-mail: ukenquiries@dryvit.com

website: www.dryvit.co.uk



Agrément Certificate

98/3548

Product Sheet 7

DRYVIT EXTERNAL WALL INSULATION SYSTEMS

DRYVIT OUTSULATION EXTERNAL WALL INSULATION SYSTEM (MASONRY)

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Dryvit Outsulation External Wall Insulation System (Masonry), comprising white or grey EPS insulation boards, adhesively fixed with supplementary mechanical fixings if required, and with reinforced basecoat and finishes. It is suitable for use, with height restrictions in some cases, on the outside of masonry external walls in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Thermal performance — the system can be used to improve the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

Strength and stability — the system can adequately resist wind loads and impact damage. The resistance to impact is dependent on the configuration of the system (see section 7).

Behaviour in relation to fire — the system's reaction to fire classification in accordance with BS EN 13501-1 : 2007 is dependent on the configuration of the system and its use is restricted in some cases (see section 8).

Risk of condensation — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of this Certificate, the system will remain effective for at least 30 years (see section 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 1 July 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Certificate amended on 13 January 2020 to include new regulatory guidance for fire in Scotland and Wales.

The BBA is a UKAS accredited certification body – Number 113.

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

Bucknalls Lane
Watford
Herts WD25 9BA

©2019

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, the Dryvit Outsulation External Wall Insulation System (Masonry), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	A1	Loading
Comment:	The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.	
Requirement:	B4(1)	External fire spread
Comment:	The system is restricted by this Requirement unless specific conditions are met. See sections 8.1 to 8.3, 8.6 and 8.9 to 8.11 of this Certificate.	
Requirement:	C2(b)	Resistance to moisture
Comment:	The system can provide a degree of protection against rain ingress. See section 10.1 of this Certificate.	
Requirement:	C2(c)	Resistance to moisture
Comment:	The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.1, 11.2 and 11.4 of this Certificate.	
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.	
Regulation:	7(1)	Materials and workmanship
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate	
Regulation:	7(2)	Materials and workmanship
Comment:	The system is restricted by this Regulation. See sections 8.1 to 8.3, 8.6 and 8.9 to 8.11 of this Certificate.	
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:	The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The system can contribute to a construction satisfying this Regulation. See sections 12 and 13.1 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	1.1	Structure
Comment:	The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.	

Standard: Comment:	2.6	Spread to neighbouring buildings The system is restricted by this Standard with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ , unless specific conditions are met. See sections 8.1, 8.2, 8.4, 8.5 and 8.7 to 8.10 of this Certificate.
Standard: Comment:	2.7	Spread on external walls The system is restricted by this Standard with reference to clause 2.7.1 ⁽¹⁾⁽²⁾ unless specific conditions are met. See sections 8.1, 8.2, 8.4, 8.5 and 8.7 to 8.10 of this Certificate.
Standard: Comment:	3.10	Precipitation The system can contribute to a construction satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.2 ⁽¹⁾⁽²⁾ . See section 10.1 of this Certificate.
Standard: Comment:	3.15	Condensation The system can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 11.3 and 11.4 of this Certificate.
Standard: Standard: Comment:	6.1(b) 6.2	Carbon dioxide emissions Building insulation envelope The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾⁽²⁾ , 6.1.3 ⁽¹⁾⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.1.10 ⁽²⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See sections 6.2 and 6.3 of this Certificate.
Standard: Comment:	7.1(a)(b)	Statement of sustainability The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.2 of this Certificate.
Regulation: Comment:	12	Building standards applicable to conversions All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: Comment:	23	Fitness of materials and workmanship The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation: Comment:	28(b)	Resistance to moisture and weather The system can provide a degree of protection against rain ingress. See section 10.1 of this Certificate.
Regulation: Comment:	29	Condensation The system can contribute to minimising the risk of interstitial and surface condensation. See section 11.4 of this Certificate.
Regulation: Comment:	30	Stability The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Regulation: Comment:	36(a)	External fire spread The system is restricted by this Regulation, unless specific conditions are met. See sections 8.1, 8.2, 8.4, 8.5 and 8.7 to 8.10 of this Certificate.

Regulation:	39(a)(i)	Conservation measures
Regulation:	40	Target carbon dioxide emission rate
Comment:	The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.	

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.2 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Dryvit Outsulation External Wall Insulation System (Masonry), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*⁽¹⁾, Part 6 *Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

(1) There is a general requirement in NHBC Standards Chapter 6.9 for fire-retardant-treated insulation to be used in accordance with BS EN 13163 : 2012.

Technical Specification

1 Description

1.1 The Dryvit Outsulation External Wall Insulation System (Masonry) consists of grey or white EPS insulation boards which are adhesively fixed to the substrate wall, with supplementary mechanical fixings if required. After the boards have been secured to the wall, basecoat (prepared as described in section 1.2) is trowel-applied to the required thickness, and the reinforcing mesh is applied and fully embedded. After the reinforced basecoat has cured, primer is applied followed by the finish.

1.2 The system is made up of the following components:

Adhesives

- Dryvit Genesis DM Plus (grey) — a polymer-modified, cement-based adhesive powder requiring the addition of 5.5 to 6.0 litres of clean water per 25 kg bag, applied at a coverage of 3.5 to 4 kg·m⁻²
- Dryvit Genesis DM Plus (white) — a polymer-modified, cement-based adhesive powder requiring the addition of 5.5 to 6.0 litres of clean water per 25 kg bag, applied at a coverage of 3.5 to 4 kg·m⁻²

Insulation⁽¹⁾

- EPS 70 (white or grey) insulation boards — expanded polystyrene (EPS) boards, 1200 by 600 mm, in a range of thicknesses between 50⁽²⁾ and 300 mm in 10 mm increments, with boards available in nominal densities between 15 kg·m⁻³ and 17 kg·m⁻³, a minimum compressive strength of 70 kN·m⁻² and nominal tensile strength of ≥ 100 kN·m⁻². The boards are manufactured to comply with the requirements for EPS 70, Class E material, to BS EN 13163 : 2012

(1) For declared thermal conductivity values (λ_D), see Table 3.

(2) Insulation thicknesses less than 50 mm are used to line reveals.

Mechanical fixings (supplementary)

Mechanical fixing⁽¹⁾ — anchors of adequate length to suit the substrate and insulation thickness, approved by the BBA and supplied by the Certificate holder, and selected from:

- Ejotharm NT U — a polyethylene HDPE anchor sleeve with a stainless steel or electro-galvanized centre pin
- Ejotharm STR U — a polyethylene HDPE anchor sleeve with a stainless steel or electro-galvanized centre screw
- Ejotharm STR U 2G — a polyethylene HDPE anchor sleeve with a stainless steel or electro-galvanized centre screw
- Ejotharm H1 eco — a polyethylene HDPE anchor sleeve with a polyamide PA GF 50 centre pin
- Koelner KI-10N — a polypropylene Tipplen K 499 anchor sleeve with an electro-galvanized centre pin (with head coating of polyamide PA6)
- Koelner TFIX-8M — a polypropylene anchor sleeve with an electro-galvanized centre pin (with head coating of polyamide PA6)
- Koelner TFIX-8S — a polypropylene anchor sleeve with an electro-galvanized centre screw (with head coating of polyamide PA6)
- Bravoll PTH-KZ — a polypropylene anchor sleeve with a stainless steel or electro-galvanized centre pin (with head coating of polyamide)
- Bravoll PTH-SX — a polypropylene anchor sleeve with a polyamide centre screw
- Bravoll PTH-S — a polypropylene anchor sleeve with a stainless steel or electro-galvanized centre screw (with head coating of polyamide)

(1) Other fixings may be used provided they can be demonstrated to have equal or higher pull-out strength, plate diameter and plate stiffness characteristics.

Basecoat

- Dryvit Genesis DM Plus (grey) — a polymer-modified, cement-based powder adhesive requiring the addition of 5.5 to 6.0 litres of clean water per 25 kg bag. The basecoat is applied to a thickness of between 2 and 6 mm, at a coverage of approximately $3 \text{ to } 3.5 \text{ kg}\cdot\text{m}^{-2}$
- Dryvit Genesis DM Plus (white) — a polymer-modified, cement-based powder adhesive requiring the addition of 5.5 to 6.0 litres of clean water per 25 kg bag. The basecoat is applied to a thickness of between 2 and 6 mm, at a coverage of approximately $3 \text{ to } 3.5 \text{ kg}\cdot\text{m}^{-2}$

Reinforcement

- Dryvit Detail mesh — 0.24 m wide alkali-resistant glass fibre mesh with a nominal weight of $150 \text{ g}\cdot\text{m}^{-2}$ and 4.6 by 3.6 mm grid size
- Dryvit Standard Plus 150 mesh — 1.0 m or 1.22 m wide alkali-resistant glass fibre mesh with a nominal weight of $150 \text{ g}\cdot\text{m}^{-2}$ and 4.6 by 3.6 mm grid size
- Dryvit Standard Plus 160 mesh — 1.0 m wide alkali-resistant glass fibre mesh with a nominal weight of $160 \text{ g}\cdot\text{m}^{-2}$ and 3.8 by 3.6 mm grid size
- Dryvit Standard Plus 200 mesh — 1.22 m wide alkali-resistant glass fibre mesh with a nominal weight of $200 \text{ g}\cdot\text{m}^{-2}$ and 4.0 by 4.0 mm grid size
- Dryvit Panzer 260 mesh — 1.0 m wide alkali-resistant glass fibre mesh with a nominal weight of $260 \text{ g}\cdot\text{m}^{-2}$ and 6.0 by 6.0 mm grid size. The mesh is applied to a maximum height of 2 metres
- Dryvit Panzer 500 mesh — 1.0 m wide alkali-resistant glass fibre mesh with a nominal weight of $522 \text{ g}\cdot\text{m}^{-2}$ and 4.0 by 3.3 mm grid size. The mesh is applied to a maximum height of 2 metres
- Dryvit Panzer 700 mesh — 1.0 m wide alkali-resistant glass fibre mesh with a nominal weight of $700 \text{ g}\cdot\text{m}^{-2}$ and 4.3 by 4.3 mm grid size. The mesh is applied to a maximum height of 2 metres
- Dryvit Intermediate mesh — 1.22 m wide alkali-resistant glass fibre mesh with a nominal weight of $376 \text{ g}\cdot\text{m}^{-2}$ and 2.5 by 3.0 mm grid size.

Primers

- Dryvit Color Prime — a ready to use water-based acrylic primer, for use with the acrylic, silicone and siloxane finishing coats and the Dryvit Drytex Wood Effect finishing coat
- Dryvit Color Prime S — a ready to use water-based acrylic primer, for use with the acrylic, silicone and siloxane finishing coats
- Dryvit Primesil — a ready to use water-based silicate primer, for optional use with the Dryvit SLK finishing coat

Finishing coats⁽¹⁾

Acrylic finishing coats

- Dryvit Stonemist and Dryvit Stonemist T — an acrylic-based emulsion containing aggregate. (Dryvit Stonemist T additionally contains mica.) Available in grain sizes from 0.6 to 0.8 mm, and with a coverage of 2.6 to 3.5 kg·m⁻²
- Dryvit Ameristone — an acrylic-based emulsion containing aggregate. Available in grain sizes from 0.8 to 2.5 mm, and with a coverage of 3 to 4.5 kg·m⁻²
- Dryvit TerraNeo — an acrylic-based emulsion containing aggregate and mica. Available in grain sizes from 0.8 to 2.5 mm, and with a coverage of 3 to 4.5 kg·m⁻²
- Dryvit PMR — an acrylic-based emulsion containing aggregate and coalescing and thickening agents. Available in six textures, with the following grain sizes: 2.0 mm (Quarzputz), 2.0 mm (Sandpebble 2), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone), and with a coverage of 2 to 3.8 kg·m⁻²
- Dryvit FD PMR — an acrylic-based emulsion with drying accelerator containing aggregate and coalescing and thickening agents. Available in five textures, with the following grain sizes: 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast) and 0.6 mm (Freestyle), and with a coverage of 1 to 2.8 kg·m⁻²

Silicone finishing coats

- Dryvit TR — an acrylic-based emulsion containing silicone resin. Available in six textures, with the following grain sizes: 2.0 mm (Quarzputz), 2.0 mm (Sandpebble 2), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone), and with a coverage of 1 to 3.8 kg·m⁻²
- Dryvit HDP — a silicone emulsion with hydrophobic additives and aggregate. Available in six textures, with the following grain sizes: 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone), and with a coverage of 1 to 2.8 kg·m⁻²

Silicate finishing coats

- Dryvit SLK — a silicate-based emulsion containing aggregate. Available in three textures, with the following grain sizes: 2.0 mm (Quarzputz), 1.6 mm (Sandpebble) and 1.2 mm (Sandblast), and with a coverage of 2.2 to 2.8 kg·m⁻²

Mineral finishing coats

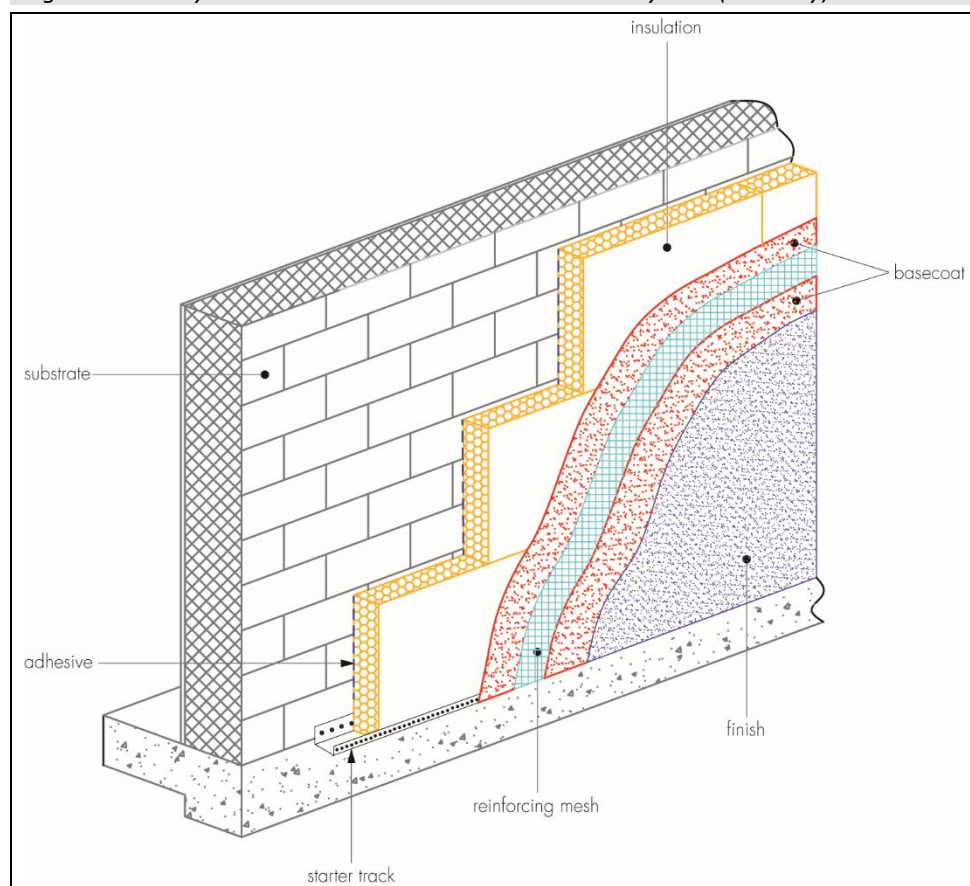
- Dryvit Drytex — a polymer-modified mineral finishing coat, requiring the addition of 5.0 to 6.0 litres of clean water per 25 kg bag. Available in three textures, with the following grain sizes: 2.0 mm (Quarzputz), 1.6 mm (Sandpebble) and 1.2 mm (Sandblast) sizes, and with a coverage of 2.2 to 2.8 kg·m⁻²
- Dryvit Drytex Wood Effect — a polymer-modified mineral finishing coat, requiring the addition of 5.5 to 6.5 litres of clean water per 25 kg bag. Available in grain size 0.5 mm and is over coated with the Wood Glaze or Wood Glaze Matt decorative coats. The product is applied to a thickness of between 4 and 5 mm, and with a coverage of 4.5 to 5 kg·m⁻²

Decorative coats

- Dryvit Demandit Smooth — an acrylic emulsion containing pigments, available in a range of colours and for use with mineral finishing coats
- Dryvit Colorsil — a silicate resin emulsion containing pigments, available in a range of colours and for use with mineral finishing coats
- Dryvit Silstar — a silicone resin emulsion containing pigments, available in a range of colours and for use with mineral finishing coats
- Dryvit HyDroPhobic — a silicone resin emulsion with hydrophobic additives and pigments, available in a range of colours and for use with mineral finishing coats
- Dryvit Wood Glaze and Dryvit Wood Glaze Matt — acrylic emulsions containing pigments, available in a range of colours and for use with the Dryvit Drytex Wood Effect finishing coat

- Dryvit Weatherlastic Smooth — an acrylic emulsion containing pigments, available in a range of colours and for use with any finishing coat
- Dryvit Demandit Sanded — an acrylic emulsion containing pigments, available in a range of colours and for use with acrylic finishing coats only

Figure 1 The Dryvit Outsulation External Wall Insulation System (Masonry)



1.3 Ancillary materials used with the system:

- A range of aluminium or PVC-U profiles, comprising:
 - starter/base profile
 - edge, corner and render stop profiles
 - connector profile and fixings.

1.4 Ancillary materials also used with the system but outside the scope of this Certificate are:

- fungicidal wash
- silicone sealant
- expanding PU foam
- extruded polystyrene insulation boards (under the dpc level).

2 Manufacture

2.1 Components are manufactured by the Certificate holder or bought in from suppliers, to an agreed specification.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process

- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Centrum Certyfikacji Jakości (Certificate 24/S/2018) and by UK Accreditation Service (UKAS) (Certificate AC 057).

3 Delivery and site handling

3.1 The insulation boards are delivered in sealed packs, with the product identification and manufacturer's batch numbers.

3.2 The other components are delivered in the quantities and packaging listed in Table 1. Each package carries the product identification and manufacturer's batch number.

Table 1 Component supply details

Component	Quantity and packaging
Dryvit Genesis DM Plus (white and grey)	25 kg bag
Dryvit Drytex	
Dryvit Drytex Wood Effect	
Dryvit Stonemist	23 kg pail
Dryvit Stonemist T	
Dryvit PMR	24.72 kg pail
Dryvit FD PMR	
Dryvit HDP	
Dryvit TR	
Dryvit SLK	
Dryvit Ameristone	24 kg pail
Dryvit TerraNeo	22 kg pail
Dryvit Color Prime	17.36 kg pail
Dryvit Color Prime S	
Dryvit Primesil	
Dryvit Colorsil	
Dryvit Demandit Sanded	
Dryvit Demandit Smooth	
Dryvit Silstar	
Dryvit HyDroPhobic	17.36 kg pail
Dryvit Wood Glaze and Dryvit Wood Glaze Matt	12.7 or 3.17 kg pails
Dryvit Weatherlastic Smooth	18.96 kg/pail
Dryvit Detail mesh	Roll, 240 mm wide by 45.7 m length
Dryvit Standard Plus 150 mesh	Roll, 1.00 m wide by 50 m length Roll, 1.22 m wide by 45.7 m length
Standard Plus 160 mesh	Roll, 1.00 m wide by 50 m length
Dryvit Standard Plus 200 mesh	Roll, 1.22 m wide by 45.7 m length
Dryvit Panzer 260 mesh	Roll, 1.00 m wide by 50 m length
Dryvit Panzer 500 mesh	Roll, 1.22 m wide by 22.9 m length
Dryvit Panzer 700 mesh	Roll, 1.22 m wide by 22.9 m length
Dryvit Intermediate 370 mesh	Roll, 1.22 m by 22.9 m length
Mechanical fixings	Boxed by manufacturer
Dryvit EPS (white and grey) insulation	Wrapped in plastic film

3.3 The insulation boards should be stored on a firm, clean, level base, off the ground and under cover until required for use. Care must be taken when handling to avoid damage.

3.4 The boards should be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. The boards should not be exposed to open flame or other ignition sources. Care must be taken when handling the boards to avoid contact with solvents or materials containing volatile organic components.

3.5 Any powder product (including adhesive, mineral renders etc.) must be stored in dry conditions, off the ground, and protected from moisture in accordance with the Certificate holder's recommendations. Contaminated materials should be discarded.

3.6 The primers and finishes must be stored in tightly closed original packaging in cool, dry conditions and protected from excessive heat and frost at all times.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Dryvit Outsulation External Wall Insulation System (Masonry).

4 General

4.1 The Dryvit Outsulation External Wall Insulation System (Masonry), when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external masonry or concrete walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building, see Figure 11).

4.2 For improved thermal/carbon-emissions performance of the structure, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of external walls of masonry, normal weight concrete, lightweight concrete, autoclaved concrete or no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render) with height restrictions in some cases (see section 8). Prior to the installation of the system, wall surfaces should comply with section 14 of this Certificate.

4.4 New walls subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS 8000-0 : 2014
- BS 8000-2.2 : 1990
- BS 8000-3 : 2001.

4.5 New walls not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.4 of this Certificate.

4.6 Movement joints should be incorporated into the system in line with existing expansion joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation.

4.7 The system will improve the weather resistance of a wall and provide a decorative finish. However, for existing buildings, it should only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

4.8 The effect of the system on the acoustic performance of a construction is outside the scope of this Certificate.

4.9 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate.

4.10 External pipework and ducts should be removed before installation, and alterations made to underground drainage to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder can advise on suitable fixing methods, but these are outside the scope of this Certificate.

4.11 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

4.12 It is essential that this system is installed and maintained in accordance with the conditions set out in this Certificate.

5 Practicability of installation

The system should only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 15).

Note: The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation (non-mandatory); details of approved installer companies are included on the BBA's website (www.bbacerts.co.uk).

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the declared thermal conductivity values (λ_D) of the insulations given in Table 2.

Table 2 Thermal conductivity of the insulation (λ_D value)

Insulation type	Thickness (mm)	Thermal conductivity ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)
EPS 70 white 038	20 to 300	0.038
EPS 70 grey 031	20 to 250	0.031
EPS 70 grey 032	20 to 250	0.032



6.2 The U value of a completed wall will depend on the insulation thickness, the type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample construction in accordance with the national Building Regulations are given in Table 3, and are based on the thermal conductivity given in Table 2 of this Certificate.

Table 3 Insulation thickness required to achieve design U values⁽¹⁾⁽²⁾⁽³⁾ given in the national Building Regulations

U value ⁽⁴⁾ ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Thickness of Insulation (mm)					
	215 mm brickwork, $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$			200 mm dense blockwork, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$		
	EPS 70 white 038	EPS 70 grey 032	EPS 70 grey 031	EPS 70 white 038	EPS 70 grey 032	EPS 70 grey 031
0.18	200	170	160	210	170	170
0.19	190	160	150	200	170	160
0.25	140	120	110	150	120	120
0.26	130	110	110	140	120	110
0.28	120	100	100	130	110	100
0.30	110	90	90	120	100	100
0.35	90	80	70	100	80	80

- (1) Wall construction inclusive of 13 mm plaster ($\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$). Declared thermal conductivity of insulation value (λ_D) is as shown in Table 2. An adhesive layer, 3 mm thick with $\lambda = 0.43 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ covering 40% of the area is also included, and a board emissivity of 0.9, together with an external render thickness of 4 mm with $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.
- (2) Calculations based on a bonded system that included 4.16 polyethylene fixings per square metre with a point thermal transmittance (X_p) of $0.002 \text{ W}\cdot\text{K}^{-1}$ per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017. A gap correction ($\Delta U''$) of zero is assumed.
- (3) Based upon an incremental insulation thickness of 10 mm.
- (4) When applying the maximum available insulation thickness, these walls can achieve U values of 0.12 to 0.13 $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ depending on insulation type and wall type.

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Strength and stability

General



7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (see also section 5 of this Certificate). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.6).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system to the ground in a satisfactory manner. The adequacy of the substrate and supporting structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All of the factors affecting wind load on each elevation and specific zones of the building must be considered. In accordance with BS EN 1990 : 2002, a partial factor of 1.5 must be applied to the calculated characteristic wind load to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight, wind and impact.

7.5 Positive wind load is transferred to the substrate wall directly via compression through the render and insulation system.

7.6 Negative wind load is transferred to the substrate wall via⁽¹⁾⁽²⁾:

- the bond between the insulation and render system (see section 7.7)
- the tensile strength of the insulation (see section 7.8)
- the bond between the adhesive and the insulation interface⁽³⁾ (see section 7.9)
- the bond between the substrate and adhesive interface⁽³⁾ (see section 7.10).

(1) For adhesively fixed systems with supplementary mechanical fixings, the contribution of the fixings is not considered when calculating resistance to wind load.

(2) Further guidance is given in BBA Guidance Note 1, available on the BBA website (www.bbacerts.co.uk).

(3) The percentage of adhesive coverage should be considered.

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was $80 \text{ kN}\cdot\text{m}^{-2}$. The design resistance of the bond between the insulation and render (N_{RD1}) should be taken as the characteristic bond resistance divided by a partial factor of 9.

7.8 The characteristic tensile resistance of the insulation material may be taken as $100 \text{ kN}\cdot\text{m}^{-2}$ and should be divided by a partial material factor of 2.5 to establish the ultimate design resistance of the insulation ($R_{d,ins}$).

7.9 The characteristic bond resistance between the adhesive and the insulation derived from test results was $80 \text{ kN}\cdot\text{m}^{-2(1)}$. The design resistance of the bond between the adhesive and insulation (N_{RD2}) should be taken as this value divided by a partial factor of 9.

(1) The minimum bonded surface area (A_{min}) should not be less than 40%.

7.10 The characteristic bond resistance between the substrate and the adhesive derived from test results was $80 \text{ kN}\cdot\text{m}^{-2}$.⁽¹⁾⁽²⁾⁽³⁾ The design resistance of the bond between the substrate and the adhesive (N_{RD3}) should be taken as the characteristic resistance divided by a partial factor of 9.

- (1) The bond between the substrate and the adhesive from the test should have a minimum failure resistance of $250 \text{ kN}\cdot\text{m}^{-2}$ after the adhesive has fully cured and in dry conditions, in accordance with ETAG 004 : 2013. The minimum failure resistance value is based on a minimum 28 day curing time of the test sample.
- (2) The results from tests carried out on site for the bond (while the adhesive is curing) between the substrate and the adhesive should be at least equal to $80 \text{ kN}\cdot\text{m}^{-2}$.
- (3) The minimum bonded surface area (A_{\min}) should not be less than 40%.

7.11 The number and spacing of the supplementary fixings should be determined by the Certificate holder. Provided the substrate wall is suitable and the supplementary fixings are covered by an appropriate ETA, the fixings will initially transfer the weight of the insulation system to the substrate wall while the adhesive is curing. However, since the characteristic pull-out resistance values are dependent on the substrate type, the fixing must be selected to suit the specific loads and substrate⁽¹⁾.

- (1) To qualify as suitable data, the age and condition of the substrate must be equivalent to that used to establish the values in the ETA. If this not the case, site-specific pull out tests must be carried out.

7.12 The data obtained from sections 7.6 to 7.9 must be assessed against the design wind load and the following expression must be satisfied:⁽¹⁾⁽²⁾.

For safe design:

$$R_d \geq W_e$$

$$R_{d,b,ins/rend} = A_r * N_{RD1}$$

$$R_{d,t,ins} = \text{characteristic tensile strength of insulation}/2.5$$

$$R_{d,b,adh/ins} = A_{\min} * N_{RD2}$$

$$R_{d,b,sub/adh} = A_{\min} * N_{RD3}$$

Where:

R_d is the design ultimate resistance ($\text{kN}\cdot\text{m}^{-2}$) taken as the minimum of $R_{d,b,ins/rend}$, $R_{d,t,ins}$, $R_{d,b,adh/ins}$ and $R_{d,b,sub/adh}$

W_e is the maximum design wind load ($\text{kN}\cdot\text{m}^{-2}$)

$R_{d,b,ins/rend}$ is the bond design resistance between the insulation and render ($\text{kN}\cdot\text{m}^{-2}$)

A_r is the reinforced basecoat bond area (based on % area covered)

N_{RD1} is the design adhesive bond resistance between the insulation and render based on tests ($\text{kN}\cdot\text{m}^{-2}$)

$R_{d,b,adh/ins}$ is the bond design resistance between the insulation and adhesive ($\text{kN}\cdot\text{m}^{-2}$)

A_{\min} is the minimum bonded surface area (based on % area covered)

N_{RD2} is the design bond resistance between insulation and adhesive based on tests ($\text{kN}\cdot\text{m}^{-2}$)

$R_{d,b,sub/adh}$ is the design bond resistance between the substrate and adhesive ($\text{kN}\cdot\text{m}^{-2}$)

N_{RD3} is the design bond resistance between the substrate and adhesive based on tests ($\text{kN}\cdot\text{m}^{-2}$)

- (1) If the minimum design resistance (R_d) calculated in 7.6 to 7.9 is less than design wind pressure, the bonded surface area (A_{\min}) should be increased.

- (2) If the minimum bonded surface area required to resist the design wind load is higher than 100%, the system would need to be mechanically fixed and therefore should not be installed: mechanically fixed system requirements have not been assessed with this Certificate.

Impact resistance

7.13 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Categories up to and including those specified in Table 4 of this Certificate.

Table 4 System impact resistance

Finishing coats	Category ⁽¹⁾		
	Any basecoat + Dryvit Plus 150 mesh	Any basecoat + Dryvit Plus 150 mesh and Dryvit Panzer 260 mesh	Any basecoat + Standard Plus 160 mesh
Dryvit Stonemist and Dryvit Stonemist T	III		
Dryvit Ameristone and Dryvit TerraNeo	II		
Dryvit PMR 2.0 mm (Quarzputz), 1.6 mm (Sandpebble, 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)	III		
Dryvit TR 2.0 mm (Quarzputz), 1.6 mm (Sandpebble, 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)	III		
Dryvit SLK 2.0 mm (Quarzputz)	II		
Dryvit SLK 1.6 mm (Sandpebble) and 1.2 mm (Sandblast)	III		
Dryvit Drytex 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast) and 0.5 mm Dryvit Drytex Wood Effect	III		
Dryvit FD PMR 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast) and 0.6 mm (Freestyle).	II		
Dryvit HDP 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone).	II		
Dryvit Ameristone, Dryvit TerraNeo, Dryvit Stonemist and Dryvit Stonemist T		II	
Dryvit PMR – 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast) and 0.6 mm (Freestyle)		II	
Dryvit PMR – 0.6 mm (Limestone)		III	
Dryvit TR 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)		III	
Dryvit Drytex 2.0 mm (Quarzputz), 1.6 mm (Sandpebble) and 1.2 mm (Sandblast)		II	
Dryvit SLK 2.0 mm (Quarzputz), 1.6 mm (Sandpebble, 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)		I	
Dryvit Stonemist and Dryvit Stonemist T			II
Dryvit PMR – 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)			II
Dryvit TR 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast), 0.6 mm (Freestyle), 0.6 mm (Limestone)			II
Dryvit FD PMR — 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast) and 0.6 mm (Freestyle)			II
Dryvit HDP 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandpebble Fine), 1.2 mm (Sandblast), 0.6 mm (Freestyle) and 0.6 mm (Limestone)			III
Dryvit SLK 2.0 mm (Quarzputz), SLK 1.6 mm (Sandpebble) and 1.2 mm (Sandblast)			II
Dryvit Drytex 2.0 mm (Quarzputz), 1.6 mm (Sandpebble), 1.2 mm (Sandblast) and 0.5 mm Dryvit Drytex Wood Effect			III

(1) The use Categories are defined in ETAG 004 : 2013 as:

- Category I — a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II — a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

8 Behaviour in relation to fire



8.1 The fire classification of the system is given in Table 5 in accordance with BS EN 13501-1 : 2007⁽¹⁾ where the maximum declared organic content is less than or equal to 4% for adhesives and basecoats and less than or equal to the value given in Table 5 for finish coats and decorative coats. The Certificate holder can advise on systems meeting this specification.

(1) ITB Warszawa Test Report Numbers 1167.1/15/R64NP, 1167.2/15/R64NP, 1167.3/15/R64NP, 1167.4/15/R64NP, 1167.5/15/R64NP, 1167.6/15/R64NP, 1167.7/15/R64NP and 1167.8/15/R64NP.

Table 5 Fire classifications

Configuration	Maximum organic content for finish and decorative coats (%)	Classification according to BS EN 13501-1 : 2007
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 or Standard Plus 160 Quarzputz TR, Quarzputz PMR (with relevant key coats: Color Prime, Color Prime S) 	12.5	C-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 or Standard Plus 160 Quarzputz HDP, Sandpebble HDP, Sandpebble Fine HDP, Sandblast HDP, Freestyle HDP, Limestone HDP (with relevant key coats: Color Prime, Color Prime S, Weatherlastic Smooth) 	12	B-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 or Standard Plus 160 Ameristone/TerraNeo, Stonemist/Stonemist T (with relevant key coats: Color Prime, Color Prime S, Weatherlastic Smooth, Demandit Sanded) 	11	B-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 or Standard Plus 160 Quarzputz FD PMR, Sandpebble FD PMR, Sandpebble Fine FD PMR, Sandblast FD PMR, Freestyle FD PMR (with relevant key coats: Color Prime, Color Prime S, Weatherlastic Smooth, Demandit Sanded) 	15	B-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 or Standard Plus 160 Sandpebble PMR, Sandpebble 2 PMR, Sandpebble Fine PMR, Sandblast PMR, Freestyle PMR, Limestone PMR, Sandpebble TR, Sandpebble 2 TR, Sandpebble Fine TR, Sandblast TR, Freestyle TR, Limestone TR (with relevant key coats: Color Prime, Color Prime S, Weatherlastic Smooth, Demandit Sanded (for use with the PMR finishes only) 	13.5	B-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 Drytex Quarzputz, Drytex Sandpebble, Drytex Sandblast Demandit Smooth, Silstar, Colorsil, Hydrophobic, Weatherlastic Smooth, HyDroPhobic 	4 (finish coat) 29 (decorative coat)	B-s1, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 Quarzputz SLK, Sandpebble SLK, Sandblast SLK (with key coat Primesil), Weatherlastic Smooth, Colorsil 	7	B-s2, d0
<ul style="list-style-type: none"> Genesis DM Plus (white and grey) Standard Plus 150 Drytex Wood Effect (with key coat Color Prime) Wood Glaze, Wood Glaze Matt, Weatherlastic Smooth 	4 (finish coat) 99.9 (decorative coat)	B-s1, d0

8.2 The classification applies to the full range of thicknesses, finishes and colours covered by this Certificate (see section 8.1).

System with a B-s1, d0 or B-s2, d0 classification



8.3 For all buildings in England, Wales and Northern Ireland, the system is considered suitable for use on, or at any distance from, the boundary, and the system is restricted for use in buildings with no storey more than 18 m above the ground.



8.4 In Scotland, the system is not classified as non-combustible and may be used on buildings more than 1 m from a boundary and, on houses, 1 m or less from a boundary. With minor exceptions, the system should be included in calculations of unprotected area, except on houses where the external wall behind has the appropriate fire resistance.

8.5 In Scotland, the system should not be used on any building with a storey more than 11 m above the ground, or on any entertainment or assembly building with a total storey area more than 500 m², or on any hospital or residential care building with a total storey area more than 200 m².

Systems with a C-s2, d0 classification



8.6 In England, Wales and Northern Ireland, the system is not classified as non-combustible or of limited combustibility and may be used on buildings with no storey more than 18 m above the ground and 1 m or more from a boundary. With minor exceptions, the panels should be included in calculations of unprotected area.



8.7 In Scotland, the system is not classified as non-combustible and may be used on buildings more than 1 m from a boundary. With minor exceptions, the panels should be included in calculations of unprotected area.

8.8 In Scotland, the system should not be used on any building with a storey more than 11 m above the ground, or on any entertainment or assembly building with a total storey area more than 500 m², or on any hospital or residential care building with a total storey area more than 200 m².

Systems tested to BS 8414-1



8.9 When tested to BS 8414-1 the overall construction summarised below met the performance criteria in Annex B of BRE Report BR 135 : 2013. Designers should refer to the BRE assessment report P113399-1000 issue 1⁽¹⁾, available from the Certificate holder.

- Dryvit Genesis DM Plus (grey) adhesive (ribbon and dab pattern)
- insulation type — grey or white EPS grade 70
- insulation thickness — 50 to 250 mm boards for grey EPS and 50 to 300 mm boards for white EPS
- reinforcement — Any mesh embedded in Dryvit Genesis DM Plus basecoat (grey or white)
- Color Prime, Color Prime S and Primesil primers
- all the finishing coats and decorative coats included in section 1.2 in any colour
- 100 mm high lamella fire breaks adhesively fixed to the masonry

(1) BRE assessment report P113399-1000 issue 1 details the fire performance of the Dryvit Outsulation External Wall Insulation System against the performance criteria of BR 135, Third Edition.

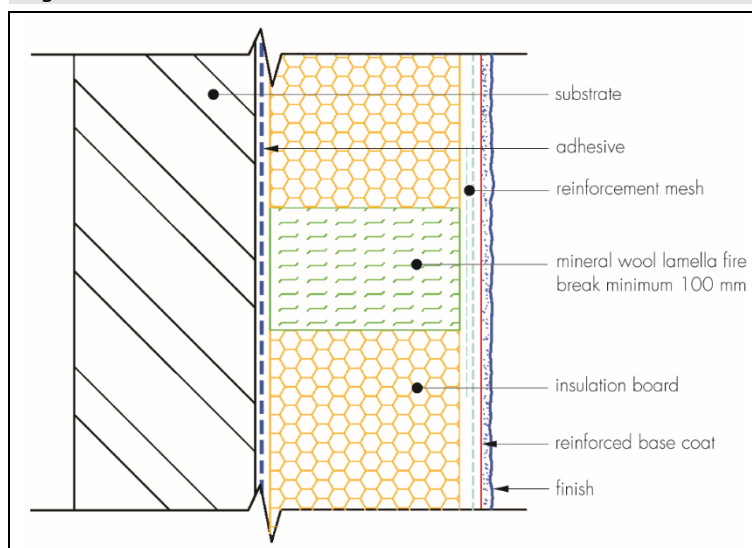
8.10 The construction described in section 8.9 is not subject to any restriction on building height or proximity to boundaries, except those described in section 8.11 of this Certificate.



8.11 The system defined in section 8.9 should not be used on buildings in England and Wales that have a storey at least 18 m above ground level and contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

8.12 For application to second storey walls and above, it is recommended that the designer considers fire barriers in line with compartment walls and floors as advised in BRE Report BR 135 : 2013 (see Figure 2 of this Certificate).

Figure 2 Fire barrier details



9 Proximity of flues and appliances

When the system is installed in close proximity to certain flue pipes, the relevant provisions of the national Building Regulations should be met:

England and Wales — Approved Document J

Scotland — Mandatory Standard 3.19, clause 3.19.4⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L.

10 Water resistance



10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that walls are adequately watertight prior to application of the system. The system must only be installed where there is no sign of dampness on the inner surface of the substrate other than that caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of water ingress.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven index, paying due regard to the design detailing, workmanship and materials to be used.

10.4 At the tops of walls, the system should be protected by an adequate coping, overhang or other detail designed for use with this type of system (see section 16).

11 Risk of condensation



11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation



11.2 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$ at any point and the junctions with other elements and openings comply with section 6.3 of this Certificate.



11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011, section 4 and Annex G, and BRE Report BR 262 : 2002.

Interstitial condensation



11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, section 4 and Annexes D and G and Table 6.

11.5 The water vapour resistance (μ) factor (for the insulation boards) and equivalent air layer thickness (s_d) (for the render systems) are shown in Table 6 of this Certificate.

Table 6 Water vapour resistance factor and equivalent air layer thickness

	s_d (m)	(μ)
Expanded polystyrene – insulation thickness 50 to 250 mm (white and grey EPS 70)	—	20 to 40 ⁽¹⁾
Dryvit Demandit Smooth	0.12	
Dryvit Silstar	0.12	
Dryvit Colorsil	0.07	
Dryvit Weatherlastic Smooth	0.02	
Dryvit HyDroPhobic	0.02	
Dryvit Demandit Sanded	0.07	
Rendering system : Any basecoat ⁽²⁾ + primer + finish coat (specific particle size) + Decorative coats, as indicated below		
Dryvit Color Prime + Dryvit Ameristone (particle size 0.8 mm)	0.65	
Dryvit Color Prime + Dryvit TerraNeo (particle size 0.8 mm)	0.66	
Dryvit Color Prime + Dryvit Stonemist (particle size 2.5 mm)	0.60	
Dryvit Color Prime + Dryvit Stonemist T (particle size 2.5 mm)	0.60	
Dryvit PMR Quarzputz (particle size 2.0 mm)	0.40	
Dryvit Color Prime + Dryvit PMR Quarzputz (particle size 2.0 mm)	0.37	
Dryvit Color Prime S + Dryvit PMR Quarzputz (particle size 2.0 mm)	0.46	
Dryvit PMR Sandpebble (particle size 1.6 mm)	0.37	
Dryvit Color Prime + Dryvit PMR Sandpebble 2 (particle size 2.0 mm)	0.25	
Dryvit FD PMR Quarzputz (particle size 2.0 mm)	0.25	
Dryvit TR Quarzputz (particle size 2.0 mm)	0.32	
Dryvit Color Prime + Dryvit TR Quarzputz (particle size 2.0 mm)	0.39	
Dryvit Color Prime S + Dryvit TR Quarzputz (particle size 2.0 mm)	0.45	
Dryvit TR Sandpebble (particle size 1.6 mm)	0.38	
Dryvit Color Prime + Dryvit TR Sandpebble 2 (particle size 2.0 mm)	0.25	
Dryvit SLK Quarzputz (particle size 2.0 mm)	0.31	
Dryvit Primesil + Dryvit SLK Sandpebble (particle size 1.6 mm)	0.15	
Dryvit Drytex Sandpebble (particle size 1.6 mm) + Dryvit Silstar	0.17	
Dryvit Drytex Quarzputz (particle size 2.0 mm) + Dryvit HyDroPhobic	0.16	
Dryvit Drytex Quarzputz (particle size 2.0 mm) + Dryvit Silstar	0.20	
Dryvit Color Prime + Dryvit Drytex Wood Effect (particle size 0.5 mm) + Dryvit Wood Glaze	0.51	
Dryvit Color Prime + Dryvit Drytex Wood Effect (particle size 0.5 mm) + Dryvit Wood Glaze Matt	0.23	
Dryvit Color Prime + Dryvit HDP Quarzputz (particle size 2.0 mm)	0.21	

(1) It is recommended that the lower figure is used when assessing the interstitial condensation risk.

(2) The basecoat was applied to a thickness between 2 and 3 mm.

12 Maintenance and repair



12.1 An initial inspection should be made within 12 months and regularly thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints, (for example, between the insulation system and window and door frame).

12.2 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2016.

13 Durability



13.1 The system will have a service life of at least 30 years, provided any damage to the surface finish is repaired immediately and regular maintenance is undertaken, as described in section 12.

13.2 The basecoats and finishes containing Portland cement may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in adverse weather conditions. The effect is transient and is less noticeable on lighter colours.

13.3 The finishes and coatings may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating, provided the coating does not too adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

Installation

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and any repairs necessary to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing
- the position of fire and cavity stop barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the bond strength between the adhesive and the substrate and be satisfied that the pull-out resistance of the proposed supplementary mechanical fixings from substrate is adequate. An assessment and recommendation should be made on the minimum bond strength and type and number of fixings required to withstand

the building's expected wind loading based on calculations using the test site data in accordance with section 7 of this Certificate.

14.3 All modifications, such as alteration to external plumbing and necessary repairs to the building structure must be completed before installation of the system commences.

14.4 Surfaces should be sound, clean, and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge tool spanning the storey height. Any excessive irregularities, ie greater than 10 mm in one metre, must be made good prior to installation, to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.5 Where surfaces are covered with an existing rendering, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

14.6 On existing buildings, purpose-made sills must be fitted to extend beyond the finished face of the system. New buildings should incorporate suitably deep sills (see Figure 9).

14.7 In new buildings, internal wet work (eg screeding or plastering) should be completed and allowed to dry prior to the application of a system.

14.8 All modifications, such as provision for fire barriers and necessary repairs to the building structure, must be completed before installation of the system commences.

15 Approved installers

Application of the system, within the context of this Certificate, must be carried out by installers approved, recommended or recognised by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member-operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections

16 Procedure

General

16.1 Installation of the system must be carried out in accordance with the Certificate holder's current installation instructions and this Certificate.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. If exposure to frost is likely or in damp/wet conditions, the render must be protected from rapid drying. The system should not be applied at temperatures below 5°C or above 25°C, except for the following:

- Dryvit FD PMR should be applied at temperatures below 20°C
- Dryvit Ameristone and Dryvit TerraNeo should be applied at temperatures from 10°C to 25°C
- Dryvit SLK and Dryvit Colorsil should be applied at temperatures from 7°C to 25°C

16.3 The planarity of the substrate must be checked, and any protrusions exceeding 10 mm removed.

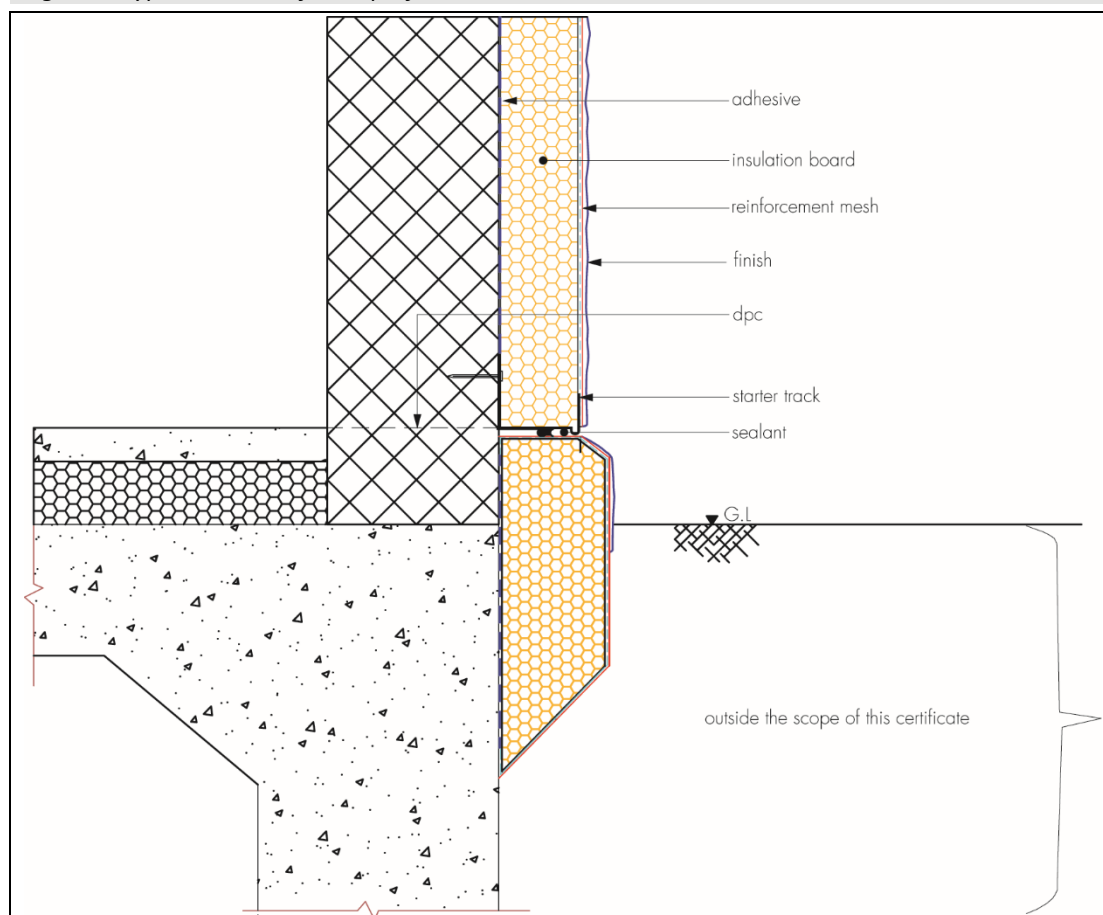
16.4 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2016.

16.5 Before installation takes place, the building designer must confirm where items such as rainwater goods, satellite dishes, clothes lines and hanging baskets will be placed. The fixing points for these items must be specifically designated and built into the system as the insulation is installed. This is outside the scope of this Certificate.

Positioning and securing insulation boards

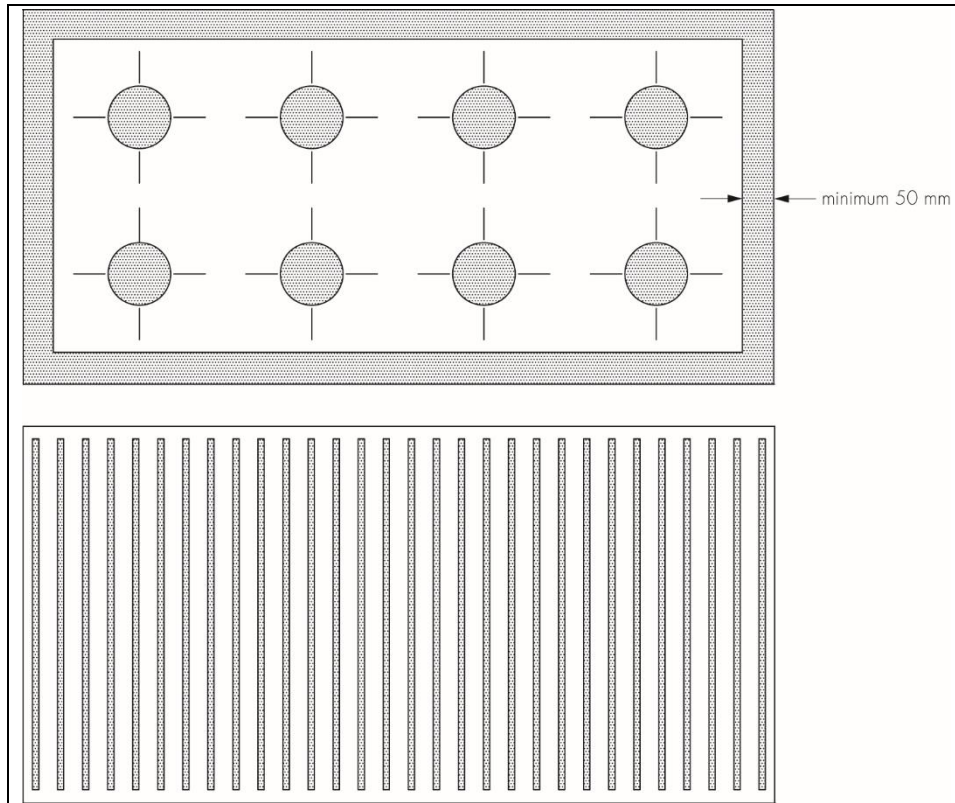
16.6 Detail mesh is attached to the substrate with Genesis DM Plus around the perimeter of all openings, penetrations, expansion joints and other system terminations. The width of mesh must be sufficient to wrap the thickness of the insulation board and create a minimum 65 mm bond on to the substrate and overlap with the main mesh on the face of the board. The base profile is secured to the external wall above the dpc using mechanical fixings at approximately 300 mm centres. Profiles and expansion joints are fitted as specified (see Figure 3).

Figure 3 Typical section of base profile



16.7 The adhesive is mixed in a suitable container using potable water and a high-power drill and paddle to create a paste-like mortar, ensuring there are no lumps in the mixed material in accordance with the Certificate holder's instructions (see section 1.2). The material must rest for 5 minutes before being mixed again to the required consistency. For the ribbon and dab method, a ribbon of adhesive (50 mm wide and 10 mm thick) is applied around the perimeter of the insulation board. Eight adhesive dabs (100mm diameter and 10 mm thick) are positioned at approximately 200 mm centres to the interior area of the insulation board, to ensure a minimum of 40% adhesive contact area can be achieved with the substrate (see Figure 4). For the notched trowel method, adhesive is scrape-trowelled to achieve ribbons spaced 10 mm wide and 13 mm deep and at a maximum of 45 mm centres (see Figure 4).

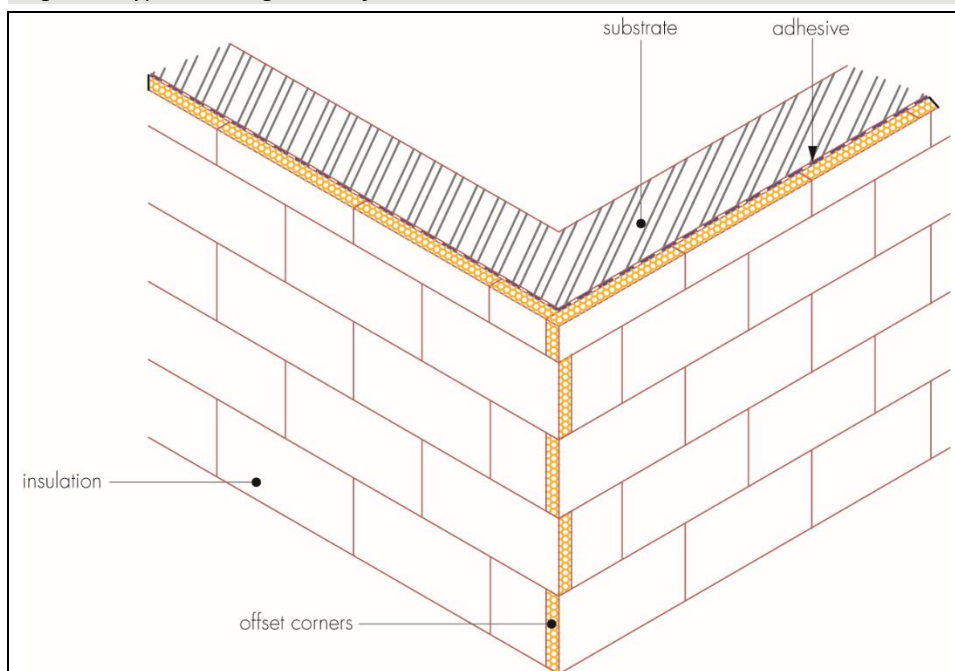
Figure 4 Insulation board dab adhesive pattern with perimeter ribbon and ribbon adhesive pattern



16.8 The first run of insulation boards is positioned on the base profile and pressed firmly against the wall. Care should be taken to ensure that all insulation board edges are butted tightly together, and alignment checked as work proceeds (to achieve a flush finish).

16.9 Subsequent rows of boards are positioned so that the vertical board joints are staggered and overlapped at the building corners (see Figure 5). Any joints in the system greater than approximately 1.5 mm but less than 7 mm should be filled with expansion foam. Joints above 7 mm should be filled with slivers of insulation board. High spots or irregularities should be removed by lightly rasping the entire area.

Figure 5 Typical arrangement of insulation boards

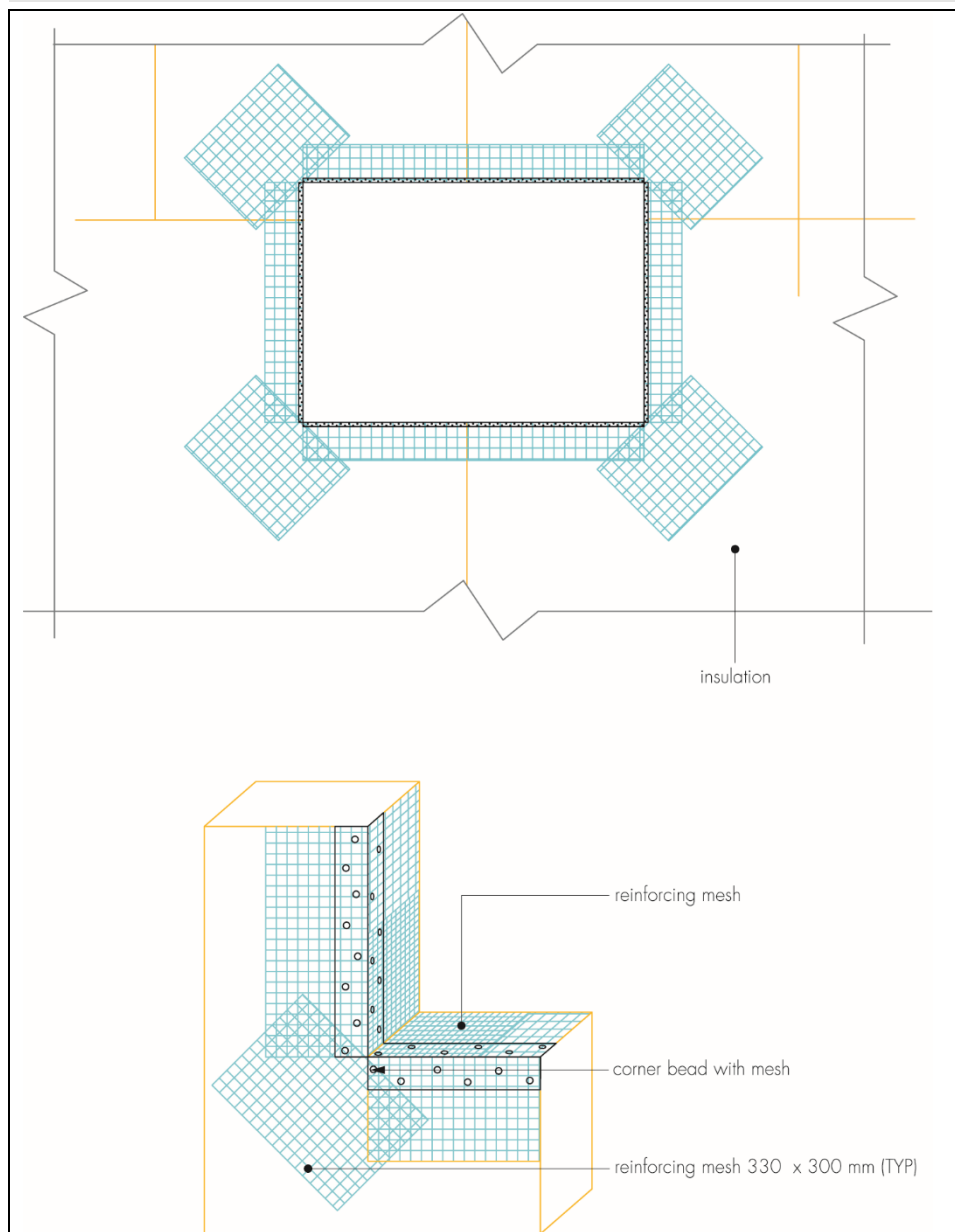


16.18 In situations where the heavy duty Panzer mesh is required, a layer of basecoat, approximately 3 mm thick, is applied over the surface of the boards and the Panzer mesh embedded. The Panzer mesh should not be overlapped but fitted with closely butted joints. The drying period for any basecoat will depend on weather conditions; however, the basecoat (with the heavy duty mesh embedded) should be allowed to dry for at least 24 hours. The Dryvit Standard Mesh or the Dryvit Standard Plus Mesh should then be applied in the manner described in section 16.17.

16.19 Pre-installed mesh strips (as described in section 16.6) must be back-wrapped around board edges, at openings, penetrations, or other termination points. The back wrap mesh is returned around the side and on to the face of the insulation board to form a minimum 65 mm overlap with the main mesh.

16.20 Additional pieces of reinforcing mesh are applied diagonally at the corners of openings to provide the necessary reinforcement in accordance with the Certificate holder's instructions (see Figure 7).

Figure 7 Additional reinforcement at openings



Rendering and finishing

16.21 Prior to applying the finishes, the relevant seals are positioned and installed at all openings (eg windows and doors), overhanging eaves, gas and electric meter boxes, wall vents or where the render abuts any other building material or surface.

16.22 The basecoat must be allowed to dry/cure (minimum 24 hours) before application of the primer/finish coat. Primers (see section 1.1 for list of primers and their compatibility with the finishing coats) must be applied and allowed to dry in accordance with the Certificate instructions. The drying time is dependent on ambient conditions, but will typically be 2 hours for Dryvit Color Prime, 4 hours for Color Prime S and 5 hours for Dryvit Primesil. After the primer is dry but prior to the application of the finishing coat, sealant should be applied as required, as defined in the project-specific site package in accordance with the Certificate holder's instructions.

16.23 Once the primer is dry, the finishes and decorative coats are applied, using the methods described for the specific finishing coats.

Dryvit Stonemist and Dryvit Stonemist T

16.24 An initial thin coat is applied, using a stainless steel trowel. A second coat is applied to the wet initial coat with a suitable spray machine. Alternatively, to achieve a flatter texture finish, the product may be applied with a stainless steel trowel.

Dryvit Ameristone

16.25 The product is applied with a suitable spray machine

Dryvit Drytex Wood Effect

16.26 The Dryvit Drytex Wood Effect render is applied to the required thickness (see section 1.1 *Finishing coats*), using a stainless steel float to create a smooth finish and is left to dry for approximately 20 to 30 minutes. The imprint surface of a Dryvit Wood Mould is coated with a clean food grade cooking oil and gently pressed onto the surface of the render, and then pressed with a 150 mm rubber roller to create the desired wood effect. The mould is immediately removed, and the process repeated until the entire wall area is covered. After 24 hours, shallow grooves are cut between the wood-effect imprints using a handheld narrow-bladed electric precision mini circular saw, to create the panel effect. The render is left to dry for a minimum of 48 hours and any oil is removed with a warm mild detergent before using a brush to apply two coats of Dryvit Wood Glaze or Dryvit Wood Glaze Matt.

Other textured finishes

16.27 The other finishes are applied to the required thicknesses (see section 1.1 *Finishing coats*) using a stainless steel trowel, and finished with a plastic float to create the desired finish. The drying time is dependent on conditions. Where specified, a compatible decorative coat can be applied using a brush, roller or a suitable spray machine. Dryvit Weatherlastic Smooth and Dryvit Demandit Sanded must only be roller applied.

16.28 Care should be taken in the detailing of the system around features such as openings, projections and at eaves (see Figures 8 to 10) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.29 The system should be allowed to dry thoroughly before painting any of the surrounding features.

16.30 At the top of walls, the system must be protected by a coping, adequate overhang or adequately sealed, purpose-made flashing.

Figure 8 Typical roof eaves detail

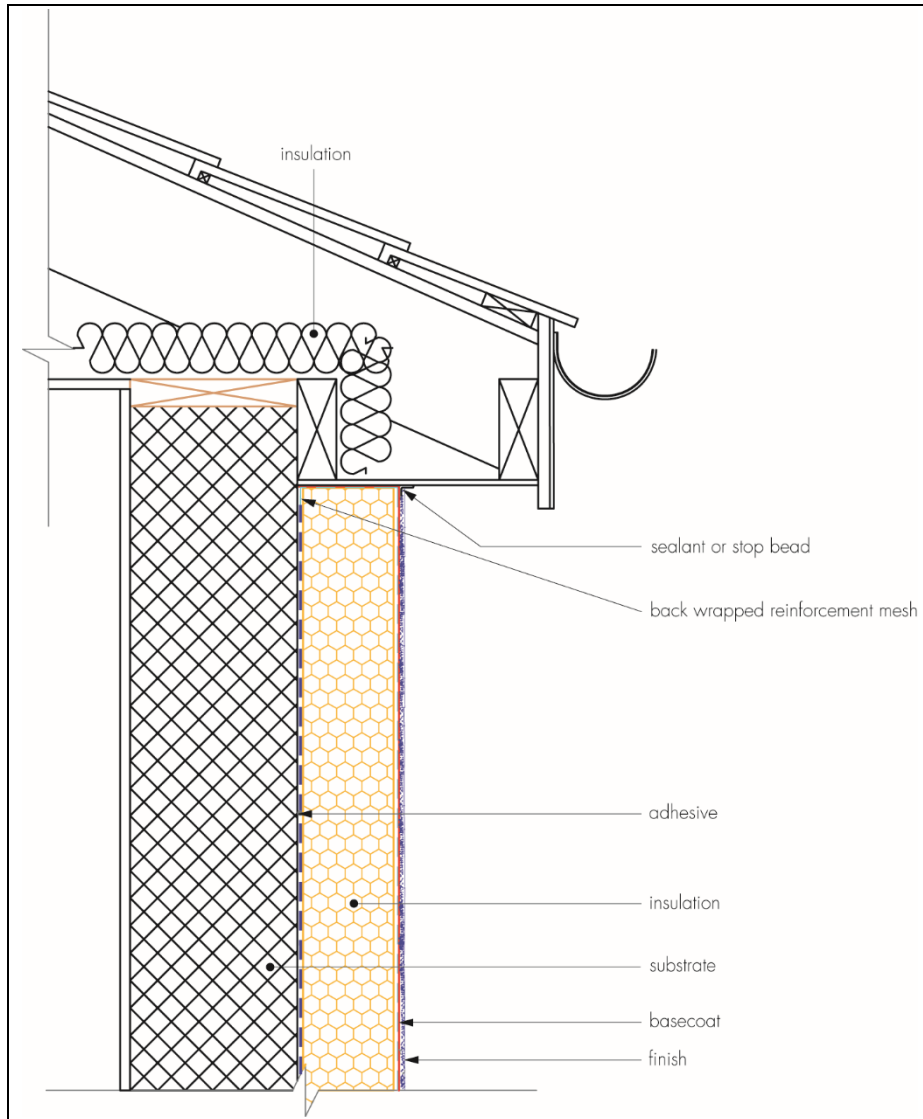


Figure 9 Insulated reveal detail

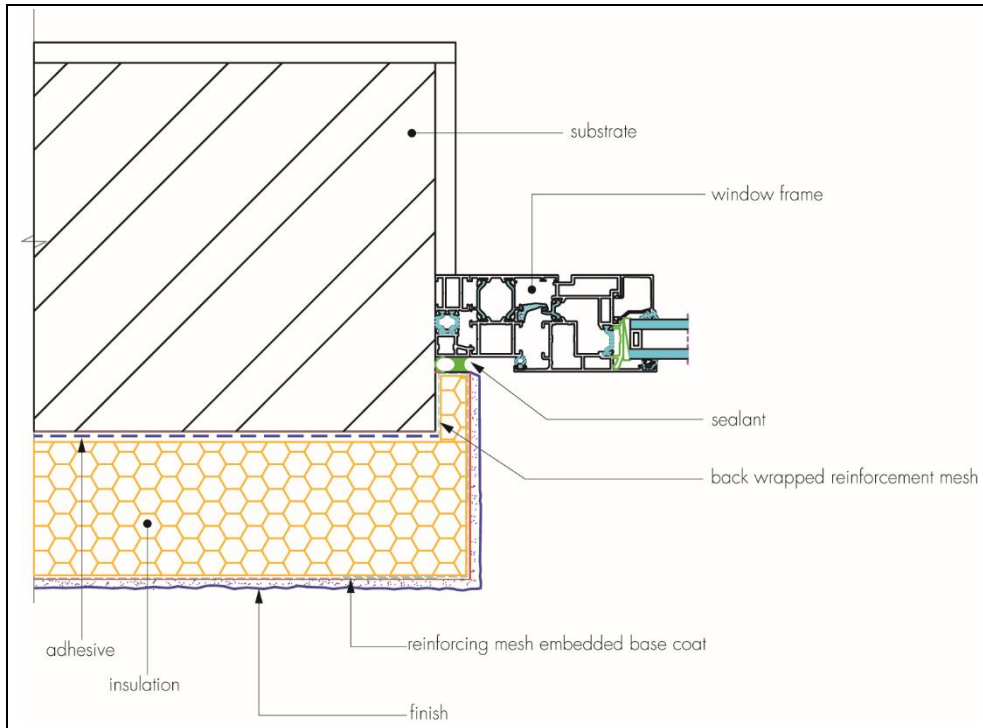


Figure 10 Insulated window head detail

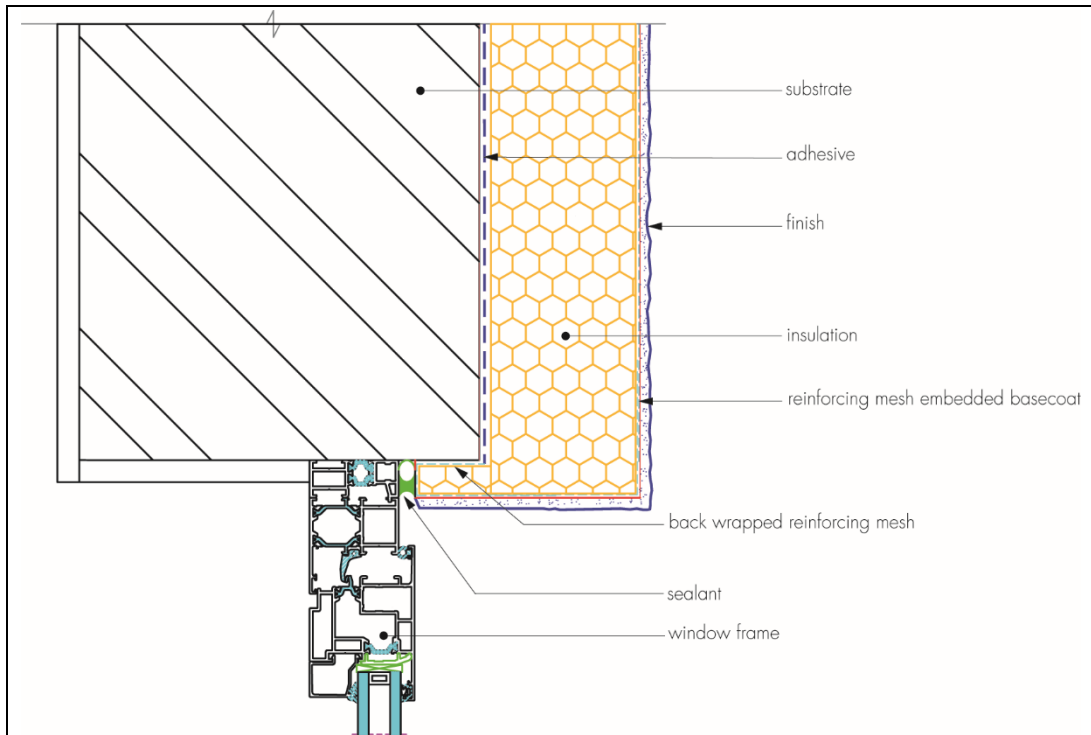
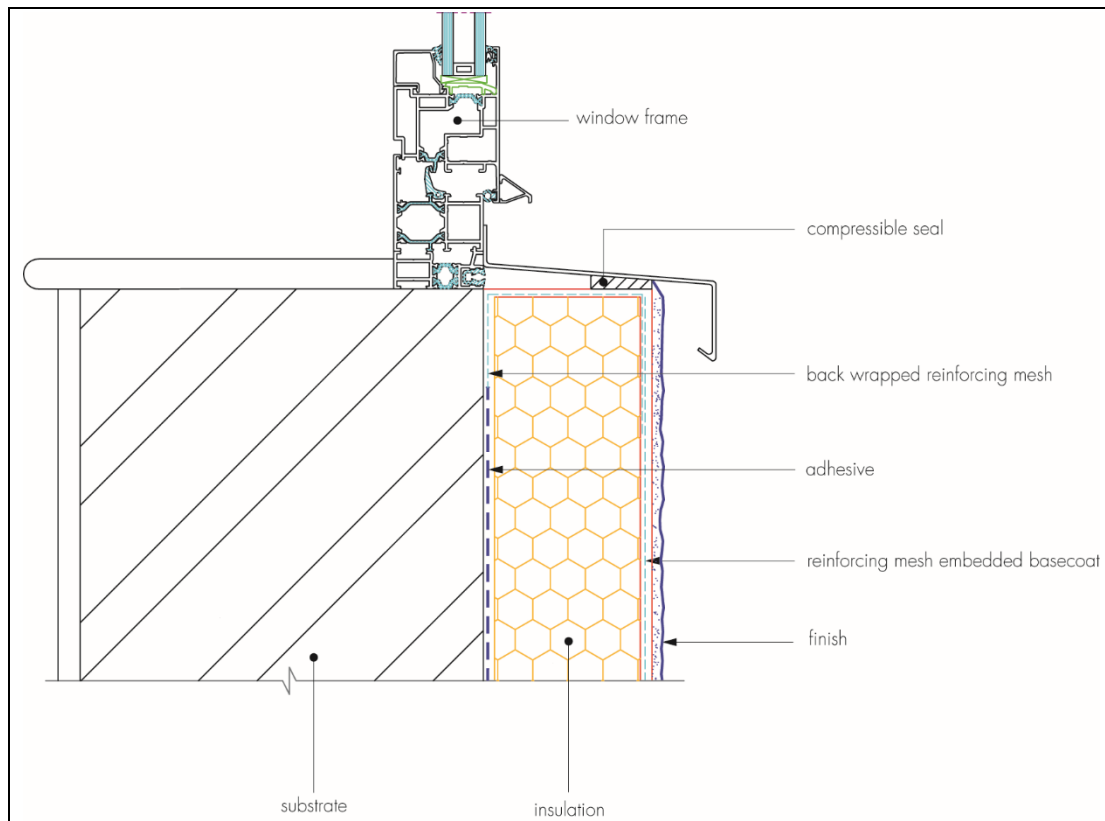


Figure 11 Window sill detail



Technical Investigations

17 Tests

17.1 An examination was made of data relating to:

- component characterisation
- water vapour permeability
- water absorption
- bond strength
- reaction to fire
- durability of finish coatings
- heat/spray cycling
- impact resistance.

17.2 An examination was made of data relating to:

- reaction to fire
- thermal conductivity
- the risk of interstitial condensation.

17.3 The practicability of installation and the effectiveness of detailing techniques were examined.

17.4 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

Bibliography

BRE Report BR 135 : 2013 *Fire performance of external thermal insulation for walls of multistorey buildings*

BRE Report BR 262 : 2002 *Thermal insulation : avoiding risk*

BRE Report BR 443 : 2006 *Conventions for U-value calculations*

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-2.2 : 1990 *Workmanship on building sites — Code of practice for concrete work — Sitework with in situ and precast concrete*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS EN 1990 : 2002 + A1 : 2005 *Eurocode — Basis of structural design*

NA to BS EN 1990 : 2002 + A1 : 2005 UK National Annex to *Eurocode — Basis of structural design*

BS 8414-1 : 2002 *Fire performance of external cladding systems — Test methods for non-loadbearing external cladding systems applied to the face of a building*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*

NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

NA + A2 : 2014 to BS EN 1992-1-1 : 2004 + A1 : 2014 UK National Annex to *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

NA to BS EN 1996-1-1 : 2005 + A1 : 2012 UK National Annex to *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

NA to BS EN 1996-2 : 2006 UK National Annex to *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 13163 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering*

18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.