I.V.A.S Industria Vernici S.p.A
Via Bellaria, 40
I-47030
San Mauro Pascoli (FC)
Italy

Tel: 01189 635 900 Fax: 01189 635 901
e-mail: enquiries@gruppoivas.co.uk
website: www.gruppoivas.com

Agrément Certificate
11/4841
Product Sheet 6

TERMOK8 EXTERNAL WALL INSULATION SYSTEMS

TERMOK8 MECCANICO RAIL (LWSF) EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet(1) relates to TermoK8 Meccanico Rail (LWSF) External Wall Insulation System, comprising an aluminium or PVC rail system mechanically fixed to a sheathed steel-framed structure thus creating a cavity, with expanded polystyrene (EPS) insulation boards, glassfibre-reinforced basecoat and render finishes, and suitable for use on new or 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 have sufficient resistance to impact damage. The impact resistance is dependent on the finish (see section 7).

Behaviour in relation to fire — the system has a B-s2, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 (see section 8). The system is suitable for buildings up to 18 metres in height; specific system configurations can be installed without height restriction.

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 Second issue: 4 June 2018

Originally certificated on 28 November 2014

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

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

Regulations

In the opinion of the BBA, TermoK8 Meccanico Rail (LWSF) External Wall Insulation System, 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 structural frame. See sections 7.1 to 7.13 of this Certificate.

Requirement: **B4(1)** **External fire spread**
Comment: The system can satisfy this Requirement. See sections 8.1 to 8.5 of this Certificate.

Requirement: **C2(b)** **Resistance to moisture**
Comment: The system provides 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 minimizing 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** **Materials and workmanship**
Comment: The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.

Regulation: **26** **Minimum energy performance requirements 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 although compensating fabric/services measures may need to be taken. 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 satisfying this Regulation. See sections 12 and 13.1 and the *Installation* 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 structural frame. See sections 7.1 to 7.13 of this Certificate.

Standard: 2.6 Spread to neighbouring buildings
Comment: The system can satisfy this Standard, with reference to clauses 2.6.4[(1)(2)], 2.6.5[(2)] and 2.6.6[(2)]. See section 8 of this Certificate.

Standard: 2.7 Spread on external walls
Comment: The system can satisfy this Standard, and is acceptable for use more than one metre from a boundary, with reference to clauses 2.7.1[(1)(2)] and 2.7.2[(2)], and Annex 2B[(1)]. See sections 8.1 to 8.6 of this Certificate.

Standard:	3.10	Precipitation
Comment:		The system can contribute to 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:	3.15	Condensation
Comment:		The system can satisfy the requirements of 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:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses 6.1.1(1)(2), 6.1.2(1)(2), 6.1.3(1), 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:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a 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) [Aspects 1(1)(2) and 2(1)], 7.1.6(1)(2) [Aspects 1(1)(2) and 2(1)] and 7.1.7(1)(2) [Aspect 1(1)(2)]. See sections 6.2 and 6.3 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment		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:	**23**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The system can contribute to minimizing the risk of interstitial condensation. See section 11.4 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.13 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The system can satisfy this Regulation. See sections 8.1 to 8.5 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
		The system can contribute to satisfying this Regulation. See sections 6.2 and 6.3 of this Certificate
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* (3.1 and 3.3) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, the TermoK8 Meccanico Rail (LWSF) Wall Insulation System, 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), Chapters 6.9 *Curtain walling and cladding* and 6.10 *Light steel framed walls and floors*.

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

Technical Specification

1 Description

1.1 The TermoK8 Meccanico Rail (LWSF) External Wall Insulation System comprises grooved expanded polystyrene (EPS) insulation boards which slot into aluminium or PVC intermediate horizontal rails that are mechanically fixed to a sheathed, lightweight steel-framed structure. The system has a reinforced render finish. The horizontal rail profiles are secured to the sheathing board through shims that create a minimum 20 mm wide cavity between the sheathing and the insulation. Basecoat render is trowel-applied to the board face in two layers; the first layer includes the embedded mesh, to an approximate thickness of 3 mm. A second layer is applied to achieve a total thickness of 6 mm. When dry, the decorative finish coat is applied to a required thickness. See Figure 1.

1.2 The system comprises the following components:

Insulation(1)

- expanded polystyrene (EPS 70) 0.32 — 500 mm by 500 mm grey insulation boards in a range of thicknesses from 60(2) mm to 200 mm, with a nominal density of 15 kg·m^{-3}, minimum compressive strength of 70 kN·m^{-2} and tensile strength perpendicular to the faces of 100 kPa. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012.
- expanded polystyrene (EPS 70) 0.38 — 500 mm by 500 mm white insulation boards in a range of thicknesses from 60(2) mm to 200 mm, with a nominal density of 15 kg·m^{-3}, minimum compressive strength of 70 kN·m^{-2} and tensile strength perpendicular to the faces of 100 kPa. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012.
- Each board has a 40 mm deep by 2 mm wide groove cut into all four edges which acts as a recess for the intermediate horizontal rail profiles. For the insulation thermal conductivity, see section 6.

(1) For the declared thermal conductivity values (λ_D), see Table 3.
(2) Insulation thicknesses of 60 mm would generally be used in reveals.

Mechanical fixings

Mechanical fixings(1) — a range of fixings, with an anchorage depth of a least 25 mm, approved and supplied by the Certificate holder:

- TS self-drilling screws —carbon steel fixing, 5.5 mm diameter with 8 mm hex drive and 12.5 mm sleeve and 50 to 80 mm lengths. Used for fixing the rails and other profiles to the steel-frame substrate.

(1) Other fixings with similar or better characteristics approved by the Certificate holder can be used.

Rail support system

- starter track rail profile — aluminium alloy, 2500 mm in length, with perforation holes for drainage, to support the boards to the framework. Fixed to the sheathed steel frame using self-tapping screws at 300 mm centres
- OR/LT intermediate horizontal rail profiles — aluminium alloy or PVC rails (2000 and 2500 mm in length respectively, by 2 mm thickness) for anchoring the boards to the framework. Fixed to the sheathed steel frame using self-tapping screws at 600 mm centres
- TK8 firebreak rails — stainless steel rails (2000 and 2500 mm in length, by 2 mm thickness) for anchoring the boards to the framework. Fixed to the sheathed steel frame using self-tapping screws at 600 mm centres
- VR/T vertical T spline profiles — aluminium alloy or PVC T-sections (495 and 470 mm lengths respectively, by 2 mm thickness. Fitted into the grooves of insulation boards to support the edges
- Packing shims (cavity spacers) — PVC packers, from 15 to 20 mm thick, to maintain the 20 mm drainage cavity width.

Fire break

- mineral wool (MW) lamella — mineral fibre boards, in sizes 500 mm by 600 mm and 600 mm by 600 mm and in thicknesses from 60 mm to 200 mm. The boards have a nominal density of 85 $kg \cdot m^{-3}$, a minimum compressive strength of 40 $kN \cdot m^{-2}$ and a tensile strength perpendicular to the faces of 80 $kN \cdot m^{-2}$. Boards are manufactured to comply with the requirements of BS EN 13162 : 2012. This insulation is only used as a fire break, and has a thermal conductivity of 0.042 ($W \cdot m^{-1} \cdot K^{-1}$).

Basecoats

- Klebocem, Klebocem Minerale and Klebocem Adefix 12 — grey or white cement-based powders with a particle size of 0.6 mm, mixed with approximately 24% water by volume to form a paste, with a coverage rate of approximately 2.5 to 3.5 $kg \cdot m^{-2}$. Applied to a minimum thickness of 6 mm.
- Klebocem Grosso — grey or white cement-based powders with a particle size of 1.2 mm, mixed with approximately 5 litres of clean water per 25 kg bag to form a paste. Applied to a minimum thickness of 6 mm.

Reinforcement

- Armatex C1 — woven alkali-resistant glassfibre reinforcement mesh, cell size approximately 3.0 by 3.5 mm, with a polymer coating and a nominal weight of 160 $g \cdot m^{-2}$.
- Acrylic brick-slip primer — water-based single-component primer, supplied in liquid form, for use with acrylic brick---slips.

Primer

- Acrylic brick-slip primer — water-based single-component primer, supplied in liquid form, for use with acrylic brick slips.

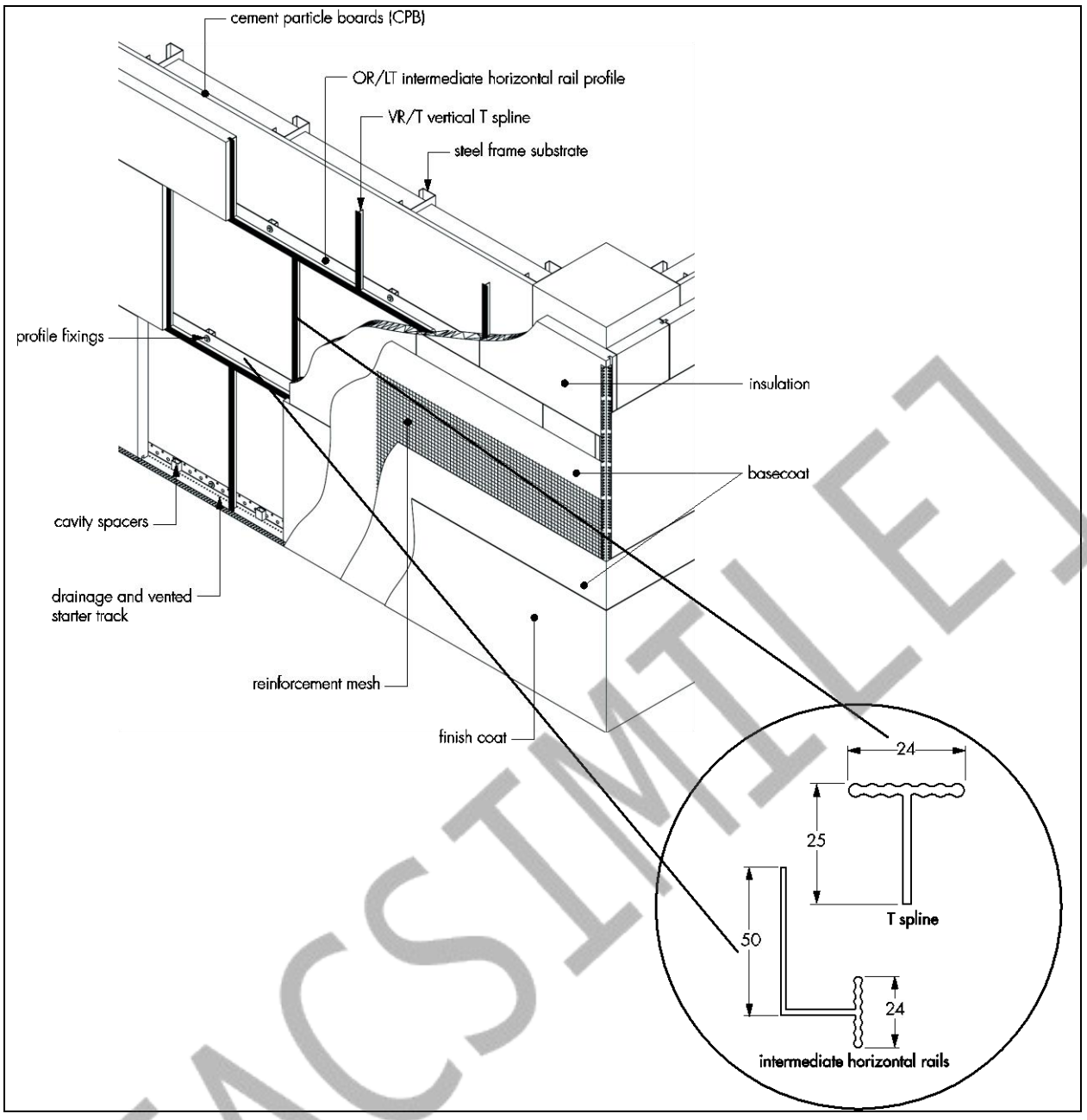
Finishes

- TermoK8 Rivatone Plus — acrylic resin-based, ready-to-use granular paste with 1.5 mm particle size, and applied to a 1.5 mm to 3 mm thickness, with a coverage rate of approximately 2.5 to 3.5 $kg.m^{-2}$. Available in a range of colours.
- TermoK8 Rivatone Idrosiliconico Plus — silicone resin-based, ready-to-use granular paste with 1.2 mm particle size, and applied to a 1.2 to 3 mm thickness, with a coverage rate of approximately per 1.5 to 2.5 $kg.m^{-2}$. Available in a range of colours.
- Termok8 Rivatone Plus TRV — silicone-enhanced acrylic resin-based, ready-to-use granular paste with 1.0, 1.2 and 1.5 mm particle sizes, and applied to a 1.0, 1.2 or 1.5 mm thickness, with a coverage rate of approximately 1.9 to 3.0 $kg.m^{2}$. Available in a range of colours
- Acrylic brick-slip — decorative profiles, 4 to 6 mm thick, 65 mm wide by 215 mm long, weather-resistant pre-coloured, acrylic brick-slips.

Top coat

- Acrylic brick-slips adhesive — organic-bound, polymer dispersion water-based ready-to-use adhesive and joint mortar. Supplied pre-colored in white, light grey and brown, and applied at a coverage of 9 $kg.m^{-2}$ to give a 2 mm thickness. For the application of the acrylic brick-slips.

Figure 1 TermoK8 Meccanico Rail (LWSF) — external wall insulation system components



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

- Mestec light-steel-frame structure
- sheathing boards
- breathable membranes
- drainage and ventilated starter track profiles to suit each insulation thickness
- stop beads and expansion joints
- water drainage deflection channels (for deflecting water around openings)
- insect mesh
- expanding gasket fire strip

- cavity fire stops — intumescent strips
- sealant.

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 system is marketed in the UK by Aliva UK (1210 Parkview, Arlington Business Park, Theale, Berkshire RG7 4TY. Tel: 01189 635 900, e-mail: enquiries@gruppoivas.co.uk).

3 Delivery and site handling

3.1 Components are delivered to site in the quantities and packages as listed in Table 1. Each package carries the product's identification marks and manufacturer's batch number.

Table 1 Components supply details[1]

Components	Quantity and packaging
Insulation	polythene-wrapped
Mechanical fixings	boxed by manufacturer
Starter track rail profile	box of 25
OR/LT intermediate horizontal rail profiles	box of 25
VR/T vertical T splines profiles	box of 100
TK8 firebreak rails	box of 25
Glassfibre-reinforced mesh	1 m wide roll, 50 m length
Klebocem basecoats	25 kg bag
TermoK8 Rivatone Plus finish coat	25 kg tub
TermoK8 Rivatone Idrosiliconico Plus finish coat	25 kg tub
TermoK8 Rivatone Plus TRV	25 kg plastic tub
Packing shims (cavity spacers)	box of 100
Acrylic brick-slips adhesive	20 kg bucket
Acrylic brick slips	200 per box

(1) Ancillary items, such as aluminium profiles or fixings, are supplied boxed as appropriate.

3.2 The insulation must be kept dry, and stored on a firm, clean, level base off the ground and protected from weather/frost and under cover until required for use. Care must be taken during handling to avoid damage.

3.3 The insulation should be protected from prolonged exposure to sunlight and contact with solvent and bitumen. The boards must not be exposed to open flame or other ignition sources.

3.4 The basecoat must be stored in dry conditions within 5 and 30 °C, off the ground and protected from moisture. Contaminated material must be discarded.

3.5 The render finishes should be stored in dry conditions, off the ground and protected from frost at all times. Damaged, wet or contaminated products should not be used and must be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the TermoK8 Meccanico Rail (LWSF) External Wall Insulation System.

Design Considerations

4 General

4.1 The TermoK8 Mechanical Rail (LWSF) External Wall Insulation System, when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external sheathed steel frame 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).

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

4.3 The system is for application to the outside of the steel frame buildings sheathed with panels on new or existing domestic and non-domestic buildings, generally up 18 m in height and, on specific system configurations, without height restrictions (see section 8.4). Prior to installation of the system, wall surfaces should comply with section 14.

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

- BS EN 1993-1-1 : 2005 and the UK National Annex
- BS 8000-0 : 2014
- BS EN 10346 : 2015
- BS EN 634-2 : 2007

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

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

4.7 The system must provide a minimum 20 mm wide drained cavity[(1)(2)] between the sheathing board and the insulation panels. This cavity is vented to allow some limited outside air ingress; however, it is classed as an unventilated cavity in accordance with BS EN ISO 6946 : 2017 and, therefore, will not affect the U-value calculation of the wall. Openings should be up to 500 mm^2 per metre of wall length (in the horizontal direction) for vertical layers. The openings must be kept clean and free of obstructions and be capable of draining freely.

(1) Horizontal deflection channels which obstruct the cavity must not be used to support the insulating render system.
(2) Cavities must not contain electrical cables other than meter tails.

4.8 The structural frame of the building, including the sheathing boards, is the responsibility of the building designer and outside the scope of this Certificate. However, the structural frame (and sheathing-associated fixings) should be structurally adequate, and must be designed to resist loads due to wind, impact and self-weight of the system (see Table 2 for minimum specifications for system installations). It is essential that appropriate movement joints are incorporated into the system (see 4.6).

Table 2 Minimum steel frame construction requirements

Item	Characteristic	Specifications
Steel-framed structure(1)	Cold-formed steel frame members should have a maximum flange width-to-thickness ratio b/t ≤ 50 in accordance with BS EN 1993-1-3 The steel structure studs should be not less than 1.2 mm thick, with 50 mm (minimum) flanges.	Exterior grade in accordance with BS EN 10346 : 2015 type S 320 GD +Z275
Sheathing board(1) (cement particle board — CPB fire rated)	12 mm thickness minimum	Nominal density of 1000 kg.m^{-3} and modulus of elasticity in bending > 4500 (N.mm^{-2}) Manufactured to BS EN 634-2 : 2007 Class 1

(1) The board and the structural steel frame must be of an exterior grade, with the minimum acceptable specification as indicated in the Table. Both components are outside the scope of this Certificate.

4.9 The system will improve the weather resistance of a wall and provide a decorative finish. However, care should be taken to ensure that walls are adequately weathertight prior to application. The system should only be installed where there are no signs of dampness on the inner surface of the wall.

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

4.11 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.

4.12 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.

4.13 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. The sheathing board must be of a suitable exterior grade with appropriately sealed joints, sealed penetrations and vapour control layers (VCL) where required. For guidance, examples of relevant detailing for external wall insulation systems are given in SCI publication P343 Insulated Render Systems Used with Light Steel Framing (Steel Construction Institute, 2006)

4.14 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; 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 conductivities values (λ_D) of the insulations given in Table 3.

Table 3 Thermal conductivity of the insulation (λ_D value)

Insulation type	Thickness (mm)	Thermal conductivity (W.m^{-1}·K^{-1})
TermoK8 EPS70E (white)	60 to 200	0.038
TermoK8 EPS70E (grey)		0.032
Termok8 MW lamella(1)	60 to 200	0.042

(1) Used as firebreak

6.2 The U value of a completed wall will depend on the insulation type and thickness, the type of rail/transom, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample constructions in accordance with the Building Regulations are given in Tables 4 and 5, and are based on the thermal conductivities given in Table 3.

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.

Table 4 Insulation thickness required to achieve design U values – PVC rails/T splines [(1)(2)(3)(4)]

U value ($W.m^{-1}.K^{-2}$)[(5)]	Thickness of insulation (mm)	
	Steel frame	
	White EPS70	Grey EPS70
0.18	200	170
0.19	190	160
0.25	140	120
0.26	140	120
0.28	130	110
0.30	120	100

(1) Wall construction inclusive of 12.5 mm plasterboard (l = 0.25 $W \cdot m^{-1} \cdot K^{-1}$), 100 mm steel frame (ignored for purposes of calculation), 12 mm cement particle board (λ = 0.23 $W \cdot m^{-1} \cdot K^{-1}$)
(2) A gap correction (DU) of 0.01 is assumed. Incremental insulation thickness of 10 mm
(3) A U value correction should be included for the PVC rails and T-splines, as described in section 6.2
(4) Insulation layer comprises 93.3% EPS70 (white or grey), and 6.7% mineral wool (lamella) acting as a fire break
(5) When applying the maximum available insulation thickness, the system can achieve U values from 0.16 to 0.18 $W \cdot m^{-2} \cdot K^{-1}$ depending on insulation type and wall type.

Table 5 Insulation thickness required to achieve design U Values – aluminium rails/T splines[(1)(2)(3)(4)]

U value ($W \cdot m^{-1} \cdot K^{-2}$)[(5)]	Thickness of insulation (mm)	
	Steel frame	
	White EPS70	Grey EPS70
0.18	–	180
0.19	200	170
0.25	140	130
0.26	140	120
0.28	130	110
0.30	120	100
0.35	100	90

(1) Wall construction inclusive of 12.5 mm plasterboard (l = 0.25 $W \cdot m^{-1} \cdot K^{-1}$), 100 mm steel frame (ignored for purposes of calculation), 12 mm cement particle board (λ = 0.23 $W \cdot m^{-1} \cdot K^{-1}$)
(2) A gap correction (DU) of 0.01 is assumed. Incremental insulation thickness of 10 mm
(3) A U value correction should be included for the aluminium rails and T-splines, as described in section 6.4
(4) Insulation layer comprises 93.3% EPS70 (white or grey), and 6.7% mineral wool (lamella) acting as a fire break
(5) When applying the maximum available insulation thickness, this system can achieve U values from 0.16 to 0.19 $W.m^{-2}.K^{-1}$ depending on insulation type and wall type.

6.4 In order to take account of the correction in a combined method U value calculation, the following Table may be used:

Table 6 Corrections to U value using the combined method

Insulation thickness (mm)	Rail length, L (m)	Wall area, A (m^2)	Aluminium profile linear thermal transmittance, $\Psi^{(1)}$ ($W \cdot m^{-1} \cdot K^{-1}$)	PVC profile linear thermal transmittance, $\Psi^{(2)}$ ($W \cdot m^{-1} \cdot K^{-1}$)
50	1	1	0.076	0.011
60	1	1	0.055	0.008
70	1	1	0.042	0.006
80	1	1	0.034	0.005
90	1	1	0.028	0.004
100	1	1	0.024	0.003
110	1	1	0.019	0.003
120	1	1	0.017	0.003
130	1	1	0.015	0.002
140	1	1	0.013	0.002
150	1	1	0.011	0.002
160	1	1	0.010	0.002
170	1	1	0.009	0.001
180	1	1	0.008	0.001
190	1	1	0.007	0.001
200	1	1	0.007	0.001

(1) Ψ can be characterised as a quad polynomial:
$\Psi = 5.428e^{-10} * d^4 - 3.197e^{-7} * d^3 + 7.044e^{-5} * d^2 - 7.046e^{-3} * d + 0.2877$
where d is the insulation thickness in mm.

(2) Ψ can be characterised as a quad polynomial:
$\Psi = 5.489e^{-11} * d^4 - 3.385e^{-8} * d^3 + 7.858e^{-6} * d2 - 8.337e^{-4} * d + 0.03650$
where d is the insulation thickness in mm.

Correction to U value should be made as follows:
$U = U_0 + [L * \Psi]/A$
Where:
U_0 is U value of wall without rail present
Ψ is linear thermal transmittance of rail (see Table 6 above)
L is length of rail (see Table 6 above)
A is wall area (see Table 6 above).

7 Strength and stability

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 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 the factors affecting wind load on each elevation and specific zone of the building must be considered. In accordance with BS EN 1990: 2002 and its UK National Annex, a partial factor of 1.5 must be applied to the characteristic values determined from BS EN 1991-1-4 to establish the ultimate 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 of the system, wind and impact.

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

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

- the bond between the insulation and the render system
- the pull-out resistance of the insulation fixing from the profiles
- the pull-through resistance of the insulation fixing
- the pull-through resistance of the profile fixing from the profiles
- the pull-out resistance of the profile fixing from the substrate (see sections 7.6 and 7.7)

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

7.7 The design bond resistance between insulation and reinforced basecoat should be greater or equal to the design wind load resistance given in section 7.10.

7.8 Typical characteristic pull-out resistances of the profile fixings from the substrate obtained from laboratory pull-out tests are shown in Table 7. The pull-out resistance depends on the fixing type, which must be selected to suit the specific loads and substrate. The typical design pull-out resistance ($N_{rd.Typ}$) is derived by dividing the characteristic test resistance value by the partial factor given in Table 7.

Table 7 Typical characteristic pull-out resistances of profile fixings from the substrate

Fixing type	Substrate facing	Characteristic pull-out strength(1) (kN)	Partial factor(2)
Self-tapping screws (5.5 mm diameter with 50 to 80 mm lengths)	Through the support rails, cavity spacer, 12 mm CPB board thickness	2.75	1.5

(1) Values obtained from tests or from the fixing's datasheet

(2) The partial factor should be applied to obtain the typical design pull-out resistance ($N_{rd.Typ}$) and depends on the substrate material.

7.9 The design pull-out resistance of the profile fixings from the substrate obtained from site tests (N_{RD1}) must not be less than the typical design pull-out resistance ($N_{rd.Typ}$) for a similar substrate. The characteristic pull-out resistance based on site tests is determined in accordance with the guidance given in EOTA TR051 (characteristic pull-out resistance = 0.6 x mean of 5 lowest test results). To obtain the site design pull-out resistance of the fixings, the characteristic site pull-out resistance should be divided by the partial factor given in Table 7 for a similar substrate.

7.10 The spacing, layout and number of insulation and profile fixings was confirmed by a dynamic wind uplift test. Provided the substrate wall is suitable and the appropriate fixings are selected, the profiles and associated fixings will adequately support the system, and transfer its self-weight and wind and impact loads to the substrate wall at the maximum spacing given in section 7.10.

7.11 The dynamic wind uplift test was carried out on a sheathed steel-frame building structure and the system installed with OR/LT intermediate horizontal aluminium rail profiles at 500 mm vertical spacing. The OR/LT profiles are fastened to 12 mm thick cement particle board (providing a minimum 20 mm cavity), with self-tapping screws at 300 mm centres. VR/T vertical T splines are installed between the 60 mm insulation boards and fastened to the horizontal profiles with the layout and spacing as shown in Figure 4. The maximum design negative wind load that can be sustained by the system is determined from the dynamic wind uplift test (Rd_{Test}) and is equal to 1.7 $kN \cdot m^{-2}$.(1)(2)

(1) The maximum design wind load that can be resisted by the system corresponds to the maximum allowed spacing and centres of fixings and profiles and as described in 7.9.

(2) The design resistance is determined by dividing the characteristic resistance value obtained from a dynamic wind uplift test by a partial safety factor of 3.

7.12 The horizontal deflection of the supporting structure due to variable loads should be within acceptable limits. The suggested limit for the maximum horizontal deflection is the height of the storey/360 in accordance with UK NA to BS EN 1993-1-1 : 2005. The Certificate holder may advise on the limiting deflection for the system.

7.13 The data derived from sections 7.6 to 7.10 must be assessed against the design wind load and the following expressions must be satisfied:

For safe design:
$Rd_{Test} \geq W_e$ and $N_{RD1} \geq N_{RD.TYP}$
where
Rd_{Test} is the negative wind load resistance of the system based on test ($kN.m^{-2}$)
W_e is the maximum applied wind load ($kN.m^{-2}$)
N_{RD1} is the design pull-out resistance based on site tests (kN)
$N_{rd.Typ}$ is the typical design pull-out resistance (kN).

Impact resistance

7.14 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in Category III (1).

(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 reaction to fire classification for the system is B-s2, d0 in accordance with BS EN 13501-1 : 2007.

8.2 The fire classification applies to the full range of thicknesses and colours covered by this Certificate (when the organic content of the basecoat and finishing coat is a maximum of 3.1% and 9.4% respectively). See section 1.2 of this Certificate.

8.3 The insulations in isolation are not classified as non-combustible or of limited combustibility, and the system is generally restricted for use in buildings up to 18 metres in height; however, on the specific system configuration noted in 8.4, the system can be installed without height restriction.

8.4 The following Termok8 Meccanico External Wall Insulation System (Rail Profile System) installed onto a masonry wall (with cavity) is unrestricted in terms of height and boundary, provided the system's composition and installation are as detailed in BRE Classification Report 276664-1, Test Report 282651 and Exova Warringtonfire Test Report 387584 (available from the Certificate holder). The system was tested in accordance with BS 8414-2 : 2005, with the system build-up summarised below:

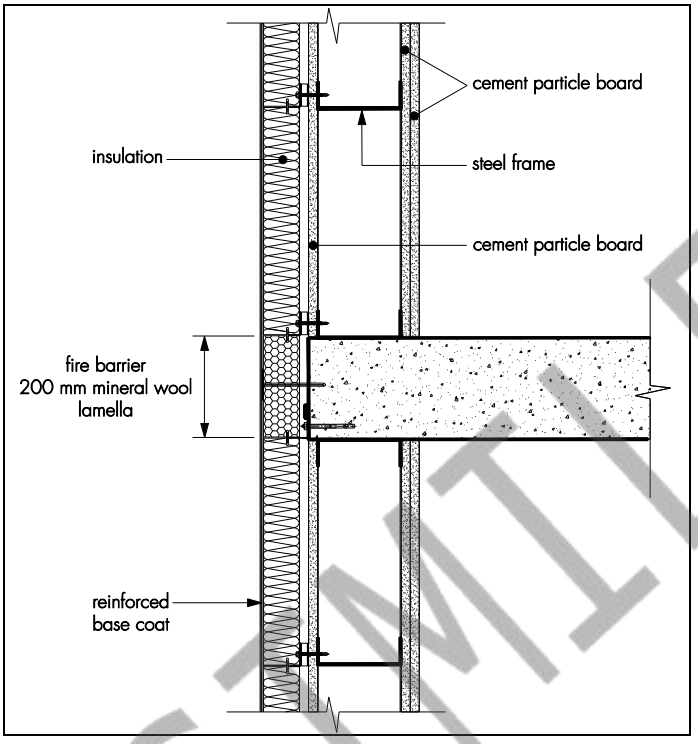
- Metsec light steel frame system
- 12.5 mm fireline boards
- 12 mm cement sheathing boards
- T spline rail system VR IVAS horizontal PVC rails and TK8 fire break rail
- 3 mm thick Armatex C1 alkaline resistance mesh
- 500 mm x 500mm x 60 mm or 500 mm x 500 mm x 200 mm slotted EPS 70E insulation boards
- VJ fire rated polyurethane expanding foam
- Rockwool lamella 95 slabs
- Sealmaster intumescent strip
- Klebocem basecoat mortar
- Rivatone Plus G15 top coat
- Decorative finish.

8.5 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the system is considered suitable for use on, or at any distance from, the boundary.

8.6 For flats and maisonettes and non-domestic building in Scotland, the system is suitable only for use more than one metre from the boundary.

8.7 The system is not classified as 'non-combustible' therefore calculations for unprotected areas may apply dependent on the fire resistance characteristics of the wall.

Figure 2 Fire barrier



9 Proximity of flues and appliances

When the insulation 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 top of walls, the system should be protected by an adequate 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 construction, including openings and penetrations at junctions between the insulation system, to minimise the risk of condensation. The recommendations of the 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 $W \cdot m^{-2} \cdot K^{-1}$ 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 $W \cdot m^{-2} \cdot K^{-1}$ 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.

11.5 The water vapour resistance factor (μ) for the insulation boards and equivalent air layer thickness (s_d) for the render system are shown in Table 8:

Table 8 Water vapour resistance factor (μ) and equivalent air layer thickness

Layers	Thickness (mm)	s_d (m)	(μ)
White EPS 70	60 to 200	–	20 to 40(1)
Rendering system: reinforced basecoat + finish coat (specific particle size) as indicated below	—	—	
Klebocem/Klebocem Minerale + TermoK8 Rivatone Plus render system (3.0 mm thickness)	6 to 10(2)	0.47	—
Klebocem/Klebocem Minerale + TermoK8 Rivatone Idrosiliconico Plus render system (1.2 mm thickness)	5 to 9(2)	0.31	—

(1) The factor (μ value) of the insulation is taken from BS EN 13163 : 2012; the lower of these values should be used for condensation risk analysis calculations.
(2) The system thickness range includes basecoat, mesh and finish.

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 of this Certificate.

13.2 Any render containing 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 less noticeable on lighter colours.

13.3 The render 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.

13.4 To maintain a high quality aesthetic appearance, it may be necessary to periodically overcoat the building using a suitable masonry coating (ie one covered by a valid BBA Certificate for this purpose). Care should be taken not to 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 whether repairs are required to the sheathing board or steel frame structure before application of the system. A specification is prepared for each elevation of the building indicating, for example:

- position of starter tracks, cavity spacer tracks and render beads
- additional reinforcing scrim at corners of openings
- detailing around windows, doors and at eaves
- dpc level
- where required, additional corner and reinforcement meshes
- location and type of weather seals to be used and location of water-deflection channels
- areas where flexible sealants must be used
- any alteration of the external plumbing
- position of fire barriers and cavity fire stops.

14.2 The survey should include tests conducted on the substrate wall of the building by the Certificate holder or their approved applicators (see section 15) to determine the pull-out resistance of the proposed OR/LT intermediate horizontal rail profile fixings. An assessment and recommendation should be made on the fixings required to withstand the building's expected wind loading based on calculations using the relevant wind speed data for the site and the pull-out resistances (see section 7).

14.3 Surfaces should be sound, clean, and free from loose material. The flatness of surfaces must be checked; this may be achieved by using a straight-edge spanning the storey height. Excessive irregularities must be corrected to ensure that the system is installed in-plane finished surface, and the adequacy of exterior grade and weather tightness of joints of the sheathed board must be checked prior to installation.

14.4 On existing buildings, purpose-made window sills must be fitted to extend beyond the finished face of the system (see section 16.9). New buildings should incorporate suitably deep sills.

14.5 All modifications, such as provision for fire stopping (see section 8) and necessary repairs to the building structure are completed before installation 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 should be carried out in accordance with the Certificate holder's current installation instructions and this Certificate.

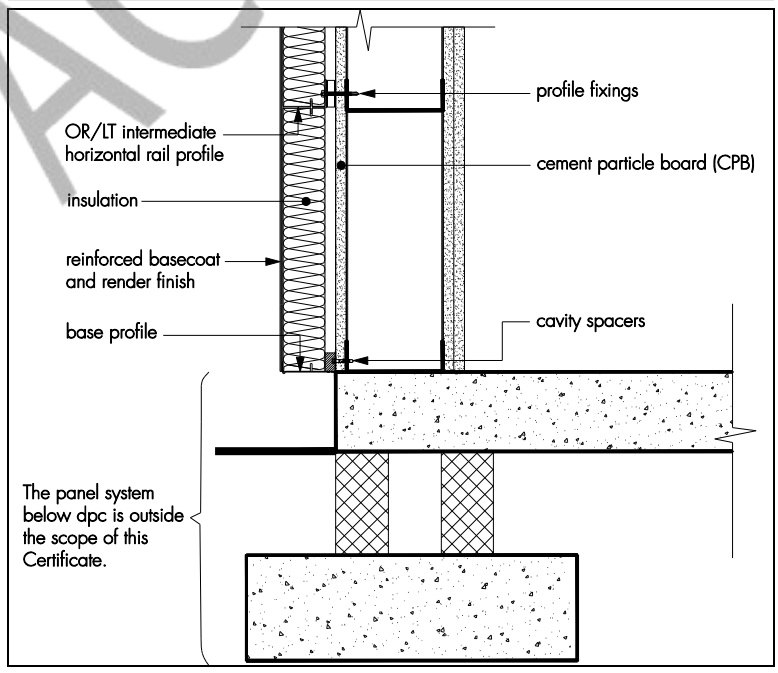
16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Installation should not take place during rainfall or if rain is anticipated. Application of the coating materials must not be carried out at temperatures below 5 or above 35°C, or if exposure to frost is likely. The coating must be protected from rapid drying. In addition, cementitious-based renders must not be applied if the temperature will fall below 0°C within 72 hours of completion.

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

Positioning and securing insulation boards

16.4 The starter track is mechanically fixed to the cement particle board and steel frame structure above the dpc (see Figure 3) at a maximum of 300 mm centres. Where it is necessary, packing shims are used at fixing points behind the starter and holding tracks to overcome surface irregularities and maintain a level drainage cavity. Extension profiles are fixed to the front lip of the starter track rail or stop end channel where appropriate. Care must be taken to ensure the fixings are not overdriven.

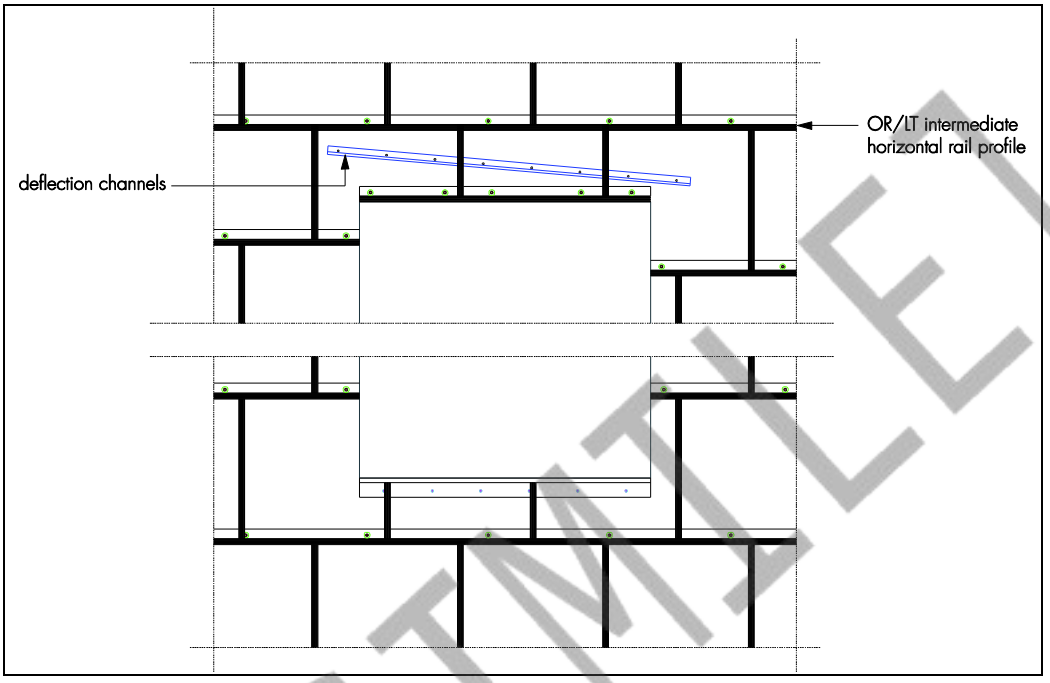
Figure 3 Typical section of base profile



16.5 The insulation boards are slotted in, aligning the track flanges with the board grooves and installing VR/T vertical T spline profiles between each board. Installation continues in this way until the first row of boards is complete.

16.6 After positioning the first row, the OR/LT intermediate horizontal rail profiles slot into the pre-cut grooves of the top edges of the installed insulation boards (see Figure 4). The level is checked and the rail is positioned away from the substrate using a specially designed 20 mm spacer. It is important that the fixing rail fits tightly and locates fully into the groove in the insulation, without being forced into position.

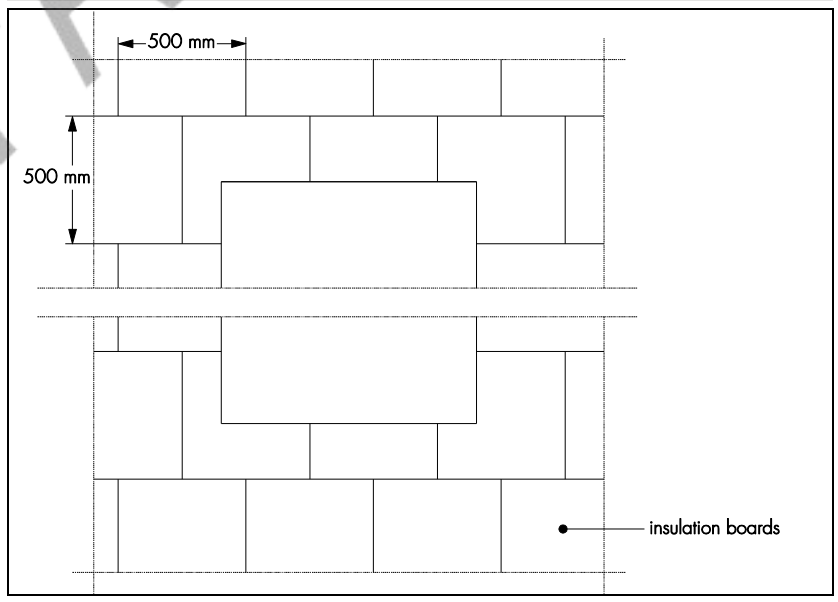
Figure 4 Arrangement of OR/LT intermediate horizontal rail profiles



16.7 The OR/LT intermediate horizontal rail profiles are fastened to the substrate with hammer-drive screws at 300 mm centres vertically and 500 mm centres horizontally. Subsequent rows of boards are installed using the same procedure.

16.8 The boards must be butted tightly together with the vertical joints staggered by a minimum of 200 mm (see Figure 5) and overlapped at the building corners. Any open joints in the insulation system must be filled with slivers of insulation board or PU foam. Horizontal fire barriers are installed following the Certificate holder's instructions.

Figure 5 Arrangement of insulation boards and pattern



16.9 To fit around details such as doors and windows, insulation boards may be cut with a sharp knife or a fine-tooth saw. Purpose-made window-sills, seals and deflection channels are mechanically fitted over all window and door openings. They are designed to prevent or manage water ingress and allow water to be shed clear of items bridging the cavity.

16.10 Care must be taken to ensure the alignment is checked as work proceeds. Any high spots or irregularities should be removed by lightly planning with a rasp over the entire surface to provide a key for the reinforcing coat.

16.11 Installation continues until the substrate is completely covered including, where appropriate, the building soffits.

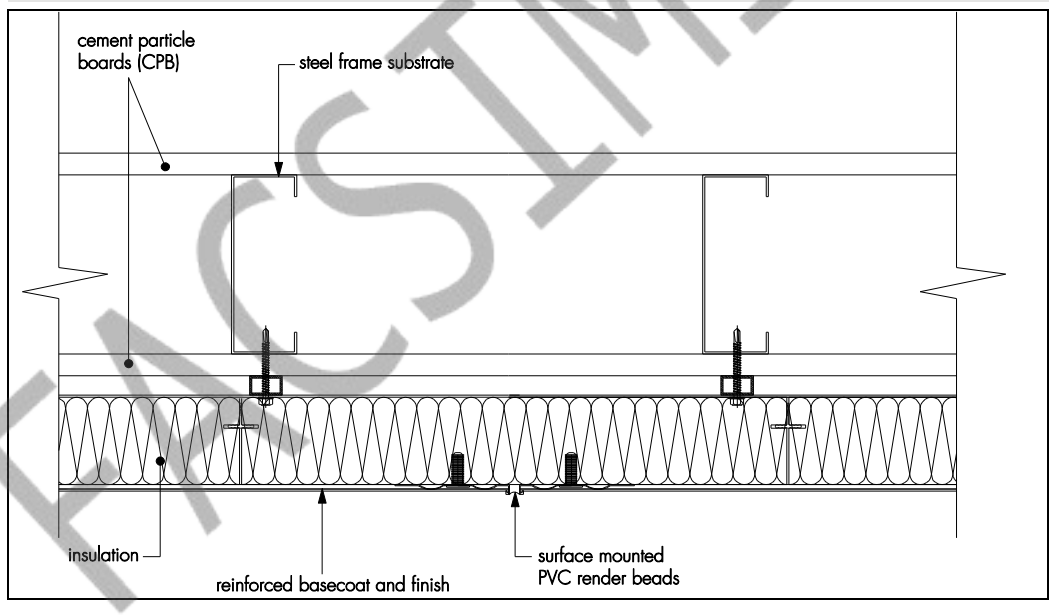
Movement joints

16.12 Movement joints should be designed dependent on the area of the system applied; however, they should be installed to accommodate any structural movement joints already incorporated within the building structure, such as deflection heads and movement on the steel frame (see Figure 6).

16.13 Expansion beads are fixed horizontally and vertically in predetermined positions where applicable, according to the installation specification and the individual requirements of each project.

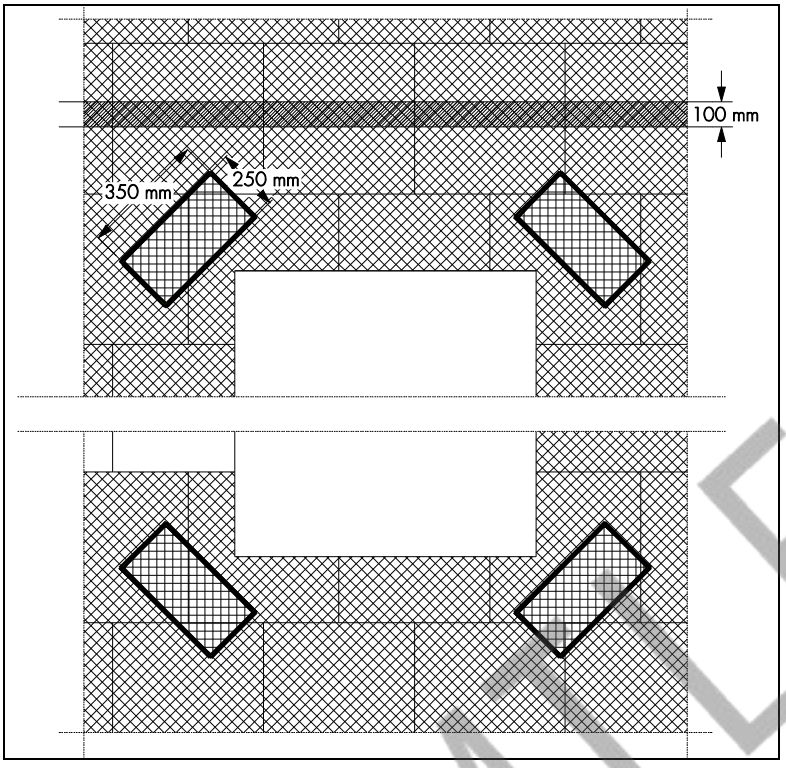
16.14 Surface-mounted PVC render beads are fixed (using firtree fixings) to the insulation boards where required.

Figure 6 Vertical movement joint



16.15 In all cases, pieces of reinforcing mesh (250 by 350 mm) are applied diagonally at the corners of windows and doors or similar openings (as shown in Figure 7) before the basecoat is applied.

Figure 7 Additional reinforcement at openings



Basecoat

16.16 The basecoat is prepared by mixing each bag with 4 to 5 litres of clean water using a paddle mixer, and is applied over the insulation boards using a stainless steel trowel, and floated with a Darby float to a 3 mm thickness.

16.17 The basecoat is applied progressively, working in one-metre sections in a vertical or horizontal direction, ensuring that meshed corner beads are bedded into the basecoat at external corners and around openings as required.

16.18 While the basecoat is still wet, the reinforcement mesh is applied, then trowelled over to ensure complete coverage. Overlapping at all mesh joints should not be less than 100 mm. Further basecoat is applied as necessary, to achieve a total overall minimum thickness of 6 mm.

16.19 The basecoat should be left to dry thoroughly before application of the finish; the drying time will depend upon the conditions, but at least 48 hours should elapse before applying the finish coats.

Finish

16.20 TermoK8 Rivatone Plus or TermoK8 Rivatone Idrosiliconico Plus is applied to a thickness from 1.2 to 3 mm (see section 1.2 of this Certificate).

16.21 Continuous surfaces should be completed without a break.

16.22 At the tops of walls, the system should be protected by an adequate overhang (see Figure 8) or by an adequately sealed purpose-made flashing. Care should be taken in the detailing of the system around openings and projections (see Figures 9, and 10).

Figure 8 Typical roof parapet detail

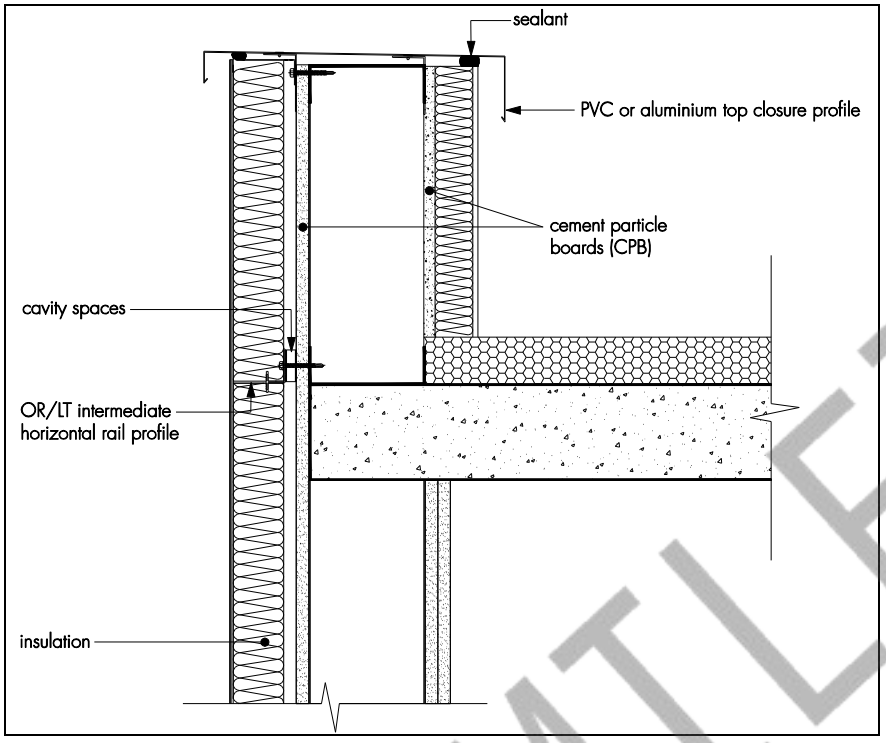


Figure 9 Typical opening details

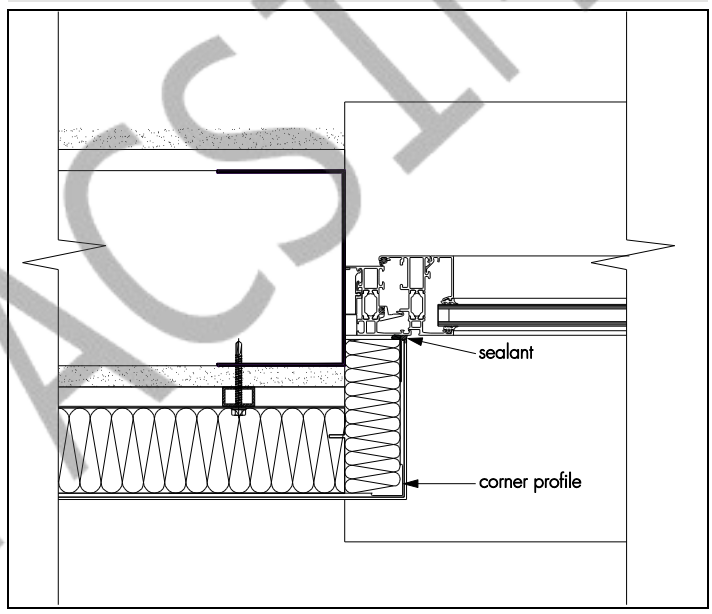
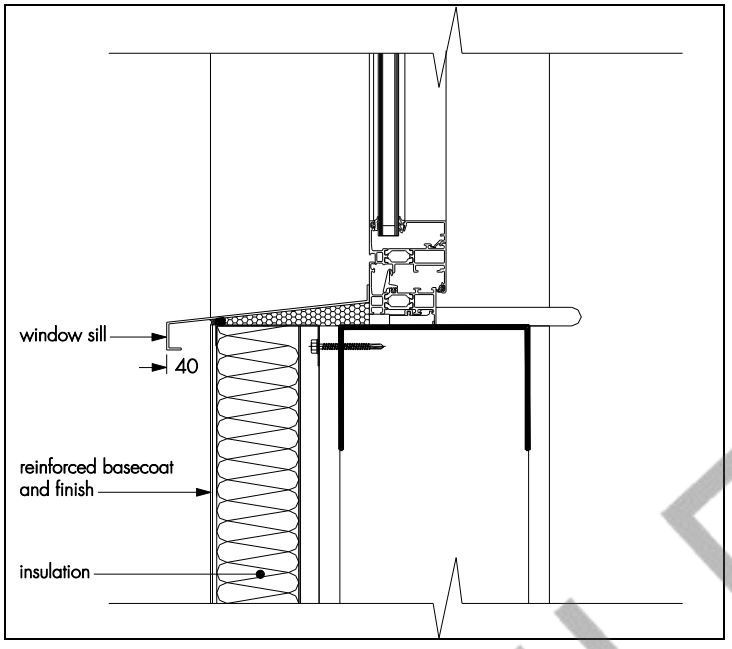


Figure 10 Window sill detail



16.23 On completion of the installation, external fittings, eg rainwater goods, are securely fixed to grounds or extended fixings that have been built into the system during installation.

Technical Investigations

17 Tests

Results of tests were assessed to determine:

- reaction to fire classification in accordance with BS EN 13501-1 : 2007
- fire resistance tests in accordance with BRE Report BR 135 : 2013
- hygrothermal performance (heat/spray cycling)
- render/insulation bond strength
- resistance to hard and soft body impact
- resistance to dynamic wind up lift
- water vapour permeability
- water absorption.

18 Investigations

18.1 An examination was made of data relating to:

- durability
- the adequacy of fixings and durability of finish.
- the risk of interstitial condensation
- thermal conductivity and example U values
- system wind load resistance.

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

18.3 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

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

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

BS 8414-2 : 2015 + A1 : 2017 *Fire performance of external cladding systems — Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame*

BS EN 634-2 : 2007 *Cement bonded particleboards — Specification — Requirements for OPC bonded particleboards for use in dry, humid and exterior conditions*

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

BS EN 1062-1 : 2004 *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Classification*

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

BS EN 1993-1-1 : 2005 *Eurocode 3 : Design of steel structures — General rules and rules for buildings*
NA + A1 : 2014 to BS EN 1993-1-1 : 2005 + A1 : 14 UK National Annex to Eurocode 3 — Design of steel structures — General rules and rules for buildings

BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*

BS EN 13162 : 2012 *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

BS EN 13163 : 2012 *Thermal insulation products for buildings — Factory made products of expanded polystyrene*

BS EN 13501-1 : 2007 *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*

BRE Report (BR 135 : 2013) *Fire Performance of External Insulation For Walls of Multi-Storey Buildings*

BRE Report (BR 262 : 2002) *Thermal insulation: avoiding risks*

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

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

19 Conditions

19.1 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 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.