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FOR THE EUROPEAN BUILDING AND
CONSTRUCTION INDUSTRY

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CERTIFICATE OF ASSESSMENT

PRODUCT

WARM-WALL POLYSTYRENE TONGUE AND GROOVED
WARM-WALL MINERAL FIBRE WOOL
WARM-WALL MINERAL FIBRE VOLAMIT
WARM-WALL RAIL SYSTEM

MARMORIT EXTERNAL WALL INSULATION SYSTEMS

SUPPLIED BY

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SUMMARY

Marmorit Warm-Wall External Wall Insulation Systems are External Thermal Insulation Composite Systems (ETICS) and have been assessed to confirm their suitability for use as external decorative and thermal insulating systems for buildings of masonry or dense concrete walls in the United Kingdom. The systems consist of an insulant, of expanded polystyrene boards or mineral fibre slabs, with a range of cementitious based coloured coating finishes. The method of providing insulation and fixing to the substrate determines which of the Marmorit Warm-Wall systems is used.

Characteristics of each external wall insulation system and its method of application have been reviewed with respect to the Building Regulations current in the United Kingdom. The assessment has referred to British Standards current in August 1998.

The assessment is described in the following pages which form integral parts of this certificate.

LIMITATIONS OF USE

Marmorit Warm-Wall External Wall Insulation Systems are certified for use on buildings with correctly detailed sound masonry or dense concrete walls with or without an existing render finish. The systems can be used for application to external vertical walls to provide an adequately moisture resistant external finish on walls in the UK where wind loadings do not exceed 2.0 kN/m². The systems must be applied with an insulation thickness no greater than 240 mm for mineral fibre, 160 mm for polystyrene. The finish must provide a minimum thickness as stated for each product. Finishes with a solar energy absorption coefficient of greater than 0.7 are not assessed. The systems are not assessed for use on exposed horizontal or sloping surfaces, or at or below ground level or in conditions of permanent contact with water.

Marmorit Warm-Wall External Wall Insulation Systems must not be considered as providing a contribution to the overall structural performance of the building or as the support for any temporary or permanent structure.

Any contribution to the airborne sound reduction performance of walls by the systems have not been assessed except for the Volamit system.

Marmorit Warm-Wall External Wall Insulation Systems must be installed and maintained strictly in accordance with the requirements of this certificate and the manufacturer's instructions as inspected by WIMLAS Limited, and only by specialist applicator firms approved by the manufacturer. Marmorit (UK) GmbH must continue to provide a technical consultancy service.

STATEMENT

It is the opinion of WIMLAS Limited that Marmorit Warm-Wall External Wall Insulation Systems for masonry or dense concrete walling are satisfactory for use within the stated limitations provided that they are used in accordance with the manufacturer's specifications, their instructions and the requirements of this certificate.

CONFIRMATION

For and on behalf of WIMLAS Limited

P D Johnson
Manager

R D Jones
Director



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1. TECHNICAL SPECIFICATION

1.1 Description of Product

1.1.1 Marmorit Warm-Wall External Wall Insulation Systems are for use as weather resistant thermally insulating decorative exterior finishes to masonry or dense concrete walls. There are four systems each of which comprise insulant, finishes and materials for fixing, and mesh reinforcement, as described below. The systems are identified as Marmorit Warm-Wall Polystyrene tongue and grooved, Marmorit Warm-Wall Mineral Fibre wool, Marmorit Warm-Wall Mineral Fibre Volamit and Marmorit Warm-Wall Rail System.



1.1.2 The insulation board is

(a) for the Marmorit Warm-Wall Polystyrene tongue and groove - expanded polystyrene tongue and groove board on all edges. Board dimensions are 1000 mm by 500 mm, with thicknesses in the range from 30 mm up to 160 mm.

(b) for the Marmorit Warm-Wall - Mineral fibre wool system - mineral fibre square edge board. Board dimensions are 800 mm by 625 mm, with thicknesses in the range from 30 mm up to 120 mm.

(c) for the Marmorit Warm-Wall - Mineral fibre Volamit - mineral fibre square edge board with combed cement based coating on the reverse. Board dimensions are 1200 mm by 200 mm, with thicknesses in the range from 50 mm up to 200 mm.

(d) for the Marmorit Warm-Wall Rail system - expanded polystyrene square-edge board with grooves on all edges. Board dimensions are 500 mm by 500 mm, with thicknesses in the range from 60 mm up to 100 mm.

1.1.3 Plastics supporting rails and metal fixings for securing the Marmorit Warm-Wall Rail System insulation.

1.1.4 Marmorit Warm-Wall plastics head fixing pins and stainless steel fixings to provide additional mechanical support for the Marmorit Warm-Wall Polystyrene and Mineral Fibre Systems.

1.1.5 Marmorit Warm-Wall SM700 bonding mortar for fixing the Marmorit Warm-Wall Polystyrene tongue and grooved, Mineral Fibre Systems insulation and Marmorit Warm-Wall Mineral fibre Volamit to the substrate and for providing the reinforcing mortar for all finishes.

1.1.6 Alkali resistant reinforcing mesh of glass fibre with a polymer coating supplied for general reinforcement.

1.1.7 Marmorit Warm-Wall primer for use where necessary, and coloured finishes of:-

Marmorit Warm-Wall PC190 -

Pico Extra Fine smooth finish render with finished thickness of 3 mm

Marmorit Warm-Wall KR200 -

Mono 3 scratch coat render with finished thickness approximately 10 mm

Marmorit Warm-Wall KW220 -

wet dash finish coat with 7 or 10 mm aggregate, with finished thickness 7 to 15 mm

Marmorit Warm-Wall NO230 -

Noblo smooth coat finish render with finished thickness of 2 and 3 mm

Marmorit Warm-Wall RO233 -

Rolls drag finish render with finished thickness 3 mm

Marmorit Warm-Wall P5288 -

Carrara sprayed finish render with finished thickness of 5 mm

Marmorit Warm-Wall Conni-Zwo

silicone based smooth finish with finished thickness of 1.7mm and 2.2mm

1.2 Product Performance

1.2.1 Marmorit Warm-Wall External Wall Insulation Systems will provide a weather resistant external wall insulation cladding to new and existing masonry or dense concrete walling elevations. This is provided that the finish and details at openings, fixtures and penetrations are maintained in accordance with the requirements of this certificate, and that the masonry or dense concrete complies with the appropriate structural requirements as defined in Building Regulations.

1.2.2 Marmorit Warm-Wall External Wall Insulation Systems will provide additional thermal resistance to a wall. The thermal conductivity of the Polystyrene insulation board has been measured as 0.032 to 0.036 W/mK. The Mineral Fibre has been measured as 0.037 W/mK. A U-value of less than 0.45 W/m²K can be achieved with the Marmorit Warm-Wall External Wall Insulation Systems in conjunction with masonry or dense concrete walling construction.

1.2.3 Tests have shown that Marmorit Warm-Wall External Wall Insulation Systems will restrict penetration of water to the substrate. The cladding is classified as Type 4 insulating cladding for permeability to water, as defined in UEAtc MOAT No 45. It is considered that the cladding system is suitable for geographic areas including those classified as having very severe exposure to wind driven rain when assessed in accordance with reference to BS 5628:Part 3 and BS 8104. Reference must also be made to BRE document BR262 (1994) "Thermal insulation - avoiding risks."

1.2.4 In fire tests Marmorit Warm-Wall External Wall Insulation Systems achieve a Class 0 surface rating with reference to the Building Regulations. With Marmorit Warm-Wall Polystyrene tongue and grooved and Rail System External Wall Insulation Systems these must be separated by fire barriers at intervals no less than the line of every floor level above the second floor in the construction and where a compartment wall abuts. The fire barriers must be applied in accordance with the instructions of Marmorit (UK) GmbH. The integrity in terms of fire resistance of the structure must be provided by other means than the Marmorit Warm-Wall Polystyrene tongue and grooved and Marmorit Warm-Wall Rail System external insulation and must be established for the construction with Marmorit Warm-Wall Mineral Fibre wool and Volamit systems.

1.2.5 Tests on the Marmorit Warm-Wall - Mineral fibre Volamit system have demonstrated that the system can make a contribution to the acoustic performance.

1.2.6 Mechanical tests on Marmorit Warm-Wall External Wall Insulation Systems using the recommended rail support system for the Marmorit Warm-Wall Rail System and bonding mortar and fixings for the Marmorit Warm-Wall Polystyrene tongue and grooved and Mineral Fibre fixing system have shown that the systems will adequately resist wind forces anticipated in the UK for locations where suction on the system is no greater than 2 kN/m². The values should be calculated in accordance with BS 6399:Part 2.

1.2.7 Marmorit Warm-Wall External Wall Insulation Systems with normal reinforcement have adequate resistance to impact damage in situations other than those below a line 1.5 m above ground level adjacent to walkways with access to pedestrians with little incentive to exercise care. Additional reinforcement is required below this height.

1.2.8 Walls designed to use Marmorit Warm-Wall External Wall Insulation Systems must be assessed for condensation risk in accordance with BS 5250. The construction can be designed to avoid condensation. Reference must also be made to BRE document BR262 (1994) "Thermal Insulation - avoiding risks".

1.2.9 Marmorit Warm-Wall External Wall Insulation Systems are considered to be durable for at least 30 years on the building on which they are incorporated provided that the system is installed, and that any damage to the system is protected from weathering before being repaired, in accordance with the requirements of the manufacturer and of this certificate.

2. BUILDING REGULATIONS

The relevant Building Regulation requirements for the product are:-

2.1 The Building Regulations (England and Wales) 1991 (as amended)

Requirement

A1 Loading - Marmorit Warm-Wall External Wall Insulation Systems will sustain and transmit wind loads to the walls on which they are installed safely and without such deflection as would impair stability, provided that each wall is constructed to comply with the requirements of BS 6399:Part 2 and the systems are applied in accordance with the requirements of this certificate.

B1 Means of escape - a wall clad with these systems can generally satisfy these conditions. There are limitations for flats and maisonettes with some configurations of protected stairway as to where the systems can contribute to this requirement; reference must be made to Approved Document B supporting these Regulations.

B4(1) External fire spread - Marmorit Warm-Wall External Wall Insulation Systems achieve a rating of Class 0 as described in these regulations and can offer adequate resistance to the spread of fire over an external wall. As the polystyrene insulant is combustible there are additional requirements for fire barriers. Vertical/horizontal fire stops must be brought through the system at the line of every floor level above the second floor level and where they are intended to be carried across a compartment wall with the Marmorit Warm-Wall Polystyrene tongue and grooved and Rail systems. However reference must also be made to Section 13 of Approved Document B supporting this regulation or to BRE document BR187 "External fire spread - building separation and boundary distances," to verify that there are no further limitations to the permissible area of an elevation, so formed at a given distance away from a notional boundary. The integrity of the whole structure in relation to fire resistance must be achieved by means other than the external insulation.

C4 Resistance to weather and ground moisture - walls finished with Marmorit Warm-Wall External Wall Insulation Systems will adequately resist the passage of moisture to the inside of the building when installed on masonry or dense concrete walls with appropriate dpc's and the systems are installed in accordance with the requirements of the manufacturer and this certificate.

E1 Airborne sound - walls. Tests on the Marmorit Warm-Wall - Mineral fibre Volamit system have demonstrated that the system can make a contribution to the acoustic performance.

J3 Protection of the building from heat-producing appliances - in order to comply with this Regulation the systems must be adequately separated from a chimney flue or a hearth. The separations are detailed in Approved Document J supporting this Regulation.

L1 Conservation of fuel and power - masonry or dense concrete walls insulated with the systems can be constructed to meet the requirements.

Regulation

7 Materials and workmanship - Marmorit Warm-Wall External Wall Insulation Systems are manufactured from materials which are

suitably safe and durable for their application and which perform satisfactorily when correctly installed.

2.2 The Building Standards (Scotland) Regulations 1990 (as amended)

Regulation

B2.1 Selection and use of materials, fittings, components and other manufactured products - Marmorit Warm-Wall External Wall Insulation Systems are manufactured from materials considered to be suitable for the application and able to resist deterioration under normal service conditions, provided that the systems are installed in accordance with the requirements of this certificate.

C2.2 Loads acting on a building - the systems will safely sustain wind loads and transmit them to the wall to which they are applied provided the wall is designed to comply with the requirements of BS 6399:Part 2 and the systems are applied in accordance with the requirements of this certificate.

D 2.1 Fire resistance and non-combustibility - the systems are a form of cladding and not a structural element and are not required to contribute to the fire resistance of a wall. The systems are not non-combustible.

D5 Cavity barriers, junctions and services openings - an elevation formed using these systems will comply with this Standard, provided that suitable cavity barriers or fire stops have been installed.

D6 Distance of sides of buildings from boundaries - the systems can comply with this Standard but reference must also be made to these provisions to verify that there are no further limitations on the permissible maximum area of an elevation formed at a given distance away from a notional boundary, other than on a wall external to a protected zone. The systems are classified as an unprotected area.

F2.5 Heat-producing, solid fuel burning, oil or gas-fired installations - walls clad with these systems can be designed and constructed to comply with these Standards, provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-producing appliance by a separation. The systems are excluded by this Standard from use as a casing for a flue.

G3.1 Resistance to precipitation - when incorporated as external insulation above dpc level to masonry or dense concrete walls in accordance with Sections 1 and 3 of this certificate the systems will assist in satisfying this requirement.

G4 Condensation - when applied to external wall construction in accordance with Sections 1 and 3 of this certificate the systems will satisfy this requirement.

H 2.1 Walls and floors to resist sound transmission. airborne sound. Tests on the Marmorit Warm-Wall - Mineral fibre Volamit system have demonstrated that the system can make a contribution to the acoustic performance of the construction.

J2.2 Conservation of fuel and power: the building fabric - performance standards. Walls clad with the systems can comply with these requirements.

2.3 The Building Regulations (Northern Ireland) 1994 (as amended)

Regulation

B2 Fitness of materials and workmanship - Marmorit Warm-Wall External Wall Insulation Systems are manufactured from materials which are considered to be safe and to be suitable for use on an external wall.

C5 Resistance to ground moisture and weather - when incorporated on external masonry or dense concrete walls in accordance with the details of design and construction given in Sections 1 and 3 of this certificate the systems will assist to satisfy this requirement.

C7 Condensation - an external wall incorporating the systems in accordance with the requirements of this certificate can be designed and constructed to prevent any harmful effect from moisture in the form of interstitial condensation.

D2 Stability - the systems will safely sustain and transmit wind loads to the wall on which it is installed without such deflections as would impair its stability, provided that the wall is designed and constructed to comply with the requirements of BS 6399:Part 2 and that the systems are applied in accordance with the requirements of this certificate.

E6 Internal fire spread - structure - an elevation designed and constructed using these systems will comply with these Regulations provided that suitable cavity barriers and fire stops have been installed.

E8 External fire spread - the systems have been demonstrated to be able to attain Class 0 surface spread of flame rating. They can comply with the requirements of this Regulation. Reference must be made to the Technical Booklet of this regulation to verify the boundary distance limitations imposed.

F2 Conservation of fuel and power - external masonry or dense concrete walls clad with the systems can comply with the requirements of this Regulation.

G2 Separating walls and separating floors. Tests on the Marmorit Warm-Wall - Mineral fibre Volamit system have demonstrated that the system can make a contribution to the acoustic performance of the construction.

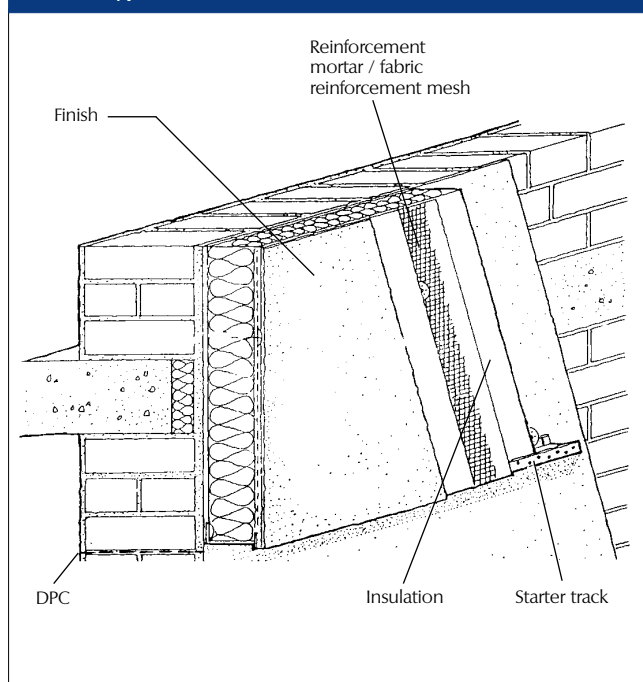
L2 Heat-producing appliances and associated constructions - the systems can comply with the Regulations provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-producing appliance by a suitable separation. The systems are excluded by the Regulations from use as casing for a flue.

3. INSTALLATION/PRACTICAL APPLICATION

3.1 Storage and Handling

3.1.1 Marmorit Warm-Wall bonding mortar and finish materials are supplied as dry, pre bagged materials in 30 kg bags which display identification and have a six month shelf life. Insulation boards are supplied in shrink wrapped packs. The materials should be stored in dry conditions and protected from the weather. The insulation boards and finish materials and accessories should not deteriorate in normal storage conditions. The packs of insulation must be stored on firm, level and dry ground. Polystyrene panels should be protected from sunlight.

FIG 1: Typical base detail



3.2 Installation

3.2.1 Marmorit Warm-Wall External Wall Insulation Systems must be installed in accordance with the requirements of the manufacturer's instructions and this certificate. The systems must be applied only by specialist applicator firms approved and monitored by Marmorit (UK) GmbH.

3.2.2 Marmorit Warm-Wall External Wall Insulation Systems are for application to masonry or dense concrete walls. The detailing and provision of trims must ensure adequate weathering protection of the system, with minimum 25 mm overhangs at the top of the insulation and below windows. Generally movement joints are not required in these systems but if an expansion joint is incorporated in the substrate, a movement joint must be provided in the insulation system.

3.2.3 A metal profile should be fixed at a position with AM300 bonding mortar at or above dpc level to coincide with the lower edge of the insulation. Insulation boards should be installed from the profile upward.

3.2.4 For the Marmorit Warm-Wall Rail System System the boards should be supported on four sides by plastic rails or T pieces. After applying each layer of insulation the rail profiles should be fixed to the substrate for the next layer. The individual boards should be laid stretcher bonded and close butt jointed.

3.2.5 For the Marmorit Warm-Wall Polystyrene tongue and grooved and Mineral Fibre System the insulation boards should be bonded to the wall with Marmorit SM700 used as a bonding mortar. The materials mixed at any time must be restricted to quantities that can be used within two hours. The bonding mortar should be applied to the board perimeter and in dabs 250 x 75 mm every 250 mm across the board, to provide a coverage of at least 40% of the board area. For the Marmorit Warm-Wall Mineral Fibre Volamit System the insulation boards should be bonded to the wall with Marmorit SM700 used as a bonding mortar. The bonding mortar should be machine applied by spraying on to the wall surface in a regular pattern to achieve at least 50% coverage.

3.2.6 For the reinforcing mortar, for the External Wall Insulation Systems Marmorit SM700 must be used. An electrical paddle type stirrer should be used to mix the SM700 contents slowly with clean cold water to a homogeneous paste. The materials mixed at any time must be restricted to quantities that can be used within two hours. The SM700 reinforcing mortar coat should not be applied until at least 48 hours after application of the insulation. It should be applied true to line and level by a trowel to a thickness of 5 mm. Reinforcement mesh should be trowelled in to the reinforcing mortar coat immediately after application. Small squares should be applied diagonally across the corners of all windows, doorways and other significant openings such that they extend equally either side of the corner before mesh is then be applied to the whole surface and in to all reveals. The minimum lap at joints in the reinforcing mesh must be 100 mm. Finally, the mortar which must penetrate through the mesh, must be trowelled smooth.

3.2.7 The finish should be applied, after the reinforcing mortar coat has cured for a minimum of 8 days, in accordance with the application instructions for the primer coat, where necessary, and the decorative coating in accordance with Marmorit recommendations.

3.2.8 Any penetrations made in the finished insulation system must have sealant installed between the system and services component to ensure the integrity of the weathering performance.

3.2.9 Annual inspections of the insulation system should be made to check the integrity of the finish and the seals at perimeters and joints. Any defects must be repaired using materials supplied by Marmorit (UK) GmbH and applied in accordance with their recommendations.

4. TECHNICAL APPRAISAL

4.1 Performance Tests

Performance tests and inspection of test data have been carried out to determine the properties and performance of the Marmorit Warm-Wall External Wall Insulation Systems including for:-

- Thermal properties
- Durability
- Bonding properties
- Resistance to wind loading
- Performance in relation to fire
- Resistance to water penetration and water vapour transmission
- Resistance to impact
- Resistance to cyclic freezing and thawing

Some of the results are outlined in Table 1.

Assessment has been made of the products and practicality of installation. Existing installations of the systems have been inspected.

4.2 Quality Control

In the opinion of WIMLAS the Marmorit Warm-Wall External Wall Insulation Systems use materials and procedures for the manufacture and installation that are suitable for the application.

Checks are carried out for control of raw material supply, at manufacture to determine physical properties, and at installation.

FIG 2: Typical window detail

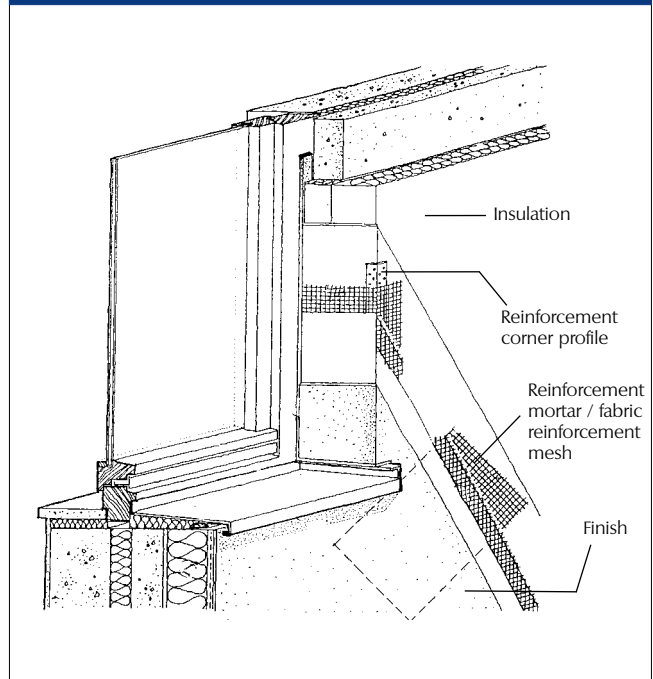


TABLE 1: Properties of the Marmorit Warm-Wall External Insulation Systems

Test	Minimum	Result					
Finish	Mono 3	KW 220	Noblo	Pico	Conni-Zwo	Rolls	Carrara
Fire properties Building Regulations Surface class	Class 0	Class 0	Class 0	Class 0	Class 0	Class 0	Class 0
Wind suction resistance kPa	>2	>2	>2	>2	>2	>2	>2
Performance of fixings. Pull out N	>1000	>1000	>1000	>1000	>1000	>1000	>1000

Thermal conductivity of insulant W/mK	
: Expanded Polystyrene	0.032-0.036
: Mineral Fibre	0.037

4.3 British Standards and other Documentation

The following British Standards and Codes of practice have been referred to for this assessment:-

BS 476:Part 6:1989	Method of test for fire propagation for products
:Part 7:1987	Method for classification of the surface spread of flame of test products.
BS 874:1973	Methods of determining thermal insulating properties with definitions of thermal insulation terms.
BS 5250:1989	Code of practice for control of condensation in building.
BS 5262:1991	Code of practice for external renderings.
BS 5628:Part 3:1985	Code of practice for use of masonry: materials and components, design and workmanship.
BS 6399:Part 2:1997	Loadings for buildings. Code of practice for wind loads.
BS 8000:Part 10:1995	Workmanship on building sites: Code of practice for plastering and rendering.
BS 8104:1992	Code of practice for assessing exposure of walls to wind-driven rain.
BS 8200:1985	Code of practice for design of non load bearing external vertical enclosures for buildings.

The following Union Europeene Pour L' Agrement Technique Dans le Construction (UEAtc) documents have been referred to for this assessment:-

UEAtc MOAT 22:1988	Directives for the assessment of external insulation systems for walls.
UAETc MOAT 45:1990	Guide to the assessment of prefabricated units for external wall insulation (insulating cladding panels).
WIMLAS	Technical Specification 005. Thermal Insulation systems

5. CONDITIONS OF CERTIFICATE ISSUE

5.1 Validity

This certificate will be valid for a period of five years.
It will remain valid in so far as:

- a) The materials and method of manufacture are unchanged.
- b) The designs and specifications are unaltered from those examined by WIMLAS.
- c) Marmorit (UK) GmbH continues to have the product checked by WIMLAS.

5.2 Health and Safety

The certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in the future; nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

5.3 Reference to Other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of the certificate.

5.4 Patents

WIMLAS makes no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the product in whole or in part is not an infringement of any patent or industrial property right not owned by Marmorit (UK) GmbH.

Confirmation that a Certificate is current may be obtained from WIMLAS.
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