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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
14/5108
Product Sheet 3

INSULETICS EXTERNAL RENDERS

INSUL-MACE

This Agrément Certificate Product Sheet(1) relates to Insul-Mace, a polymer-modified, two-coat, self-coloured cementitious render system designed to simulate a conventional brickwork finish. It is applied over Insuletics Insul-Base standard base coat render onto suitably prepared exterior substrates of existing cement render, brickwork, blockwork or concrete on new or existing 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

Weather resistance — the product is suitable for external use on new or existing buildings in areas where the local wind-driven rain index is less than 75 litres per m^2 per spell (see section 6).

Strength and stability — the product has adequate resistance to impact damage and cracking (see section 7).

Performance in relation to fire — the product is classified as 'non-combustible' as defined in the national Building Regulations (see section 9).

Durability — the product, applied over the Insuletics Insul-Base standard base coat render on a suitably prepared sound substrate, will perform satisfactorily for a period in excess of 30 years (see section 11).

The BBA has awarded this Certificate to the company named above for the product described herein. This product 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: 21 July 2014

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
Chief Executive

Certificate amended on 7 August 2015 to replace BS in section 8 and Bibliography.

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Regulations

In the opinion of the BBA, Insul-Mace, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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:	B4(1)	External fire spread
Comment:		The product is unrestricted by this Requirement. See section 9 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Walls rendered with the product can satisfy this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the product satisfies the requirements of this Regulation. See sections 10 and 11.1 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The product is not classified as 'non-combustible' and therefore is restricted by these Standards, with reference to clauses 2.6.4[(1)(2)], 2.6.5[(1)], 2.6.6[(2)] and 2.7.1[(1)(2)]. See section 9 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Walls rendered with the product can satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)], 3.10.2[(1)(2)], 3.10.3[(1)(2)] and 3.10.5[(1)(2)]. See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting 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.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments made in relation to 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

Regulation:	23(a)(b)(i)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.
Regulation:	C4(b)	Resistance to moisture and weather
Comment:		Walls rendered with the product can satisfy this Regulation. See section 6.1 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The product is unrestricted by this Regulation. See section 9 of this Certificate.

Construction (Design and Management) Regulations 2007
Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 and 3.3) and 15 *Mixing* (15.2) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Insul-Mace, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 6 *Superstructure (excluding roofs)*, Chapter 6.1 *External masonry walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 998-1 : 2010. An asterisk(*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance. Technical Specification

Technical Specification

1 Description

1.1 Insul-Mace is a polymer-modified, two-coat, self-coloured cementitious render system.

1.2 The first coat of the product is mortar-coloured whilst the second (top) coat is brick-coloured. Once the second coat has been applied, lines are cut into it to expose the mortar coat beneath, giving the appearance of conventional brickwork.

1.3 Insul-Mace mortar coat applied at a thickness of 10 mm has a weight per unit area of approximately 15.4 $kg \cdot m^{-2}$, and the subsequent 3 mm to 5 mm thickness of the brick layer has a weight per unit area of between 4.6 $kg \cdot m^{-2}$ and 7.7 $kg \cdot m^{-2}$. Insuletics Insul-Base standard base coat render applied at a thickness of 10 mm has a weight per unit area of between 14 $kg \cdot m^{-2}$ and 18 $kg \cdot m^{-2}$.

2 Manufacture

2.1 The product is manufactured using batch processes by blending measured quantities of component materials in suitable mixers.

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 : 2008 by BSI (Certificate FM 85394).

3 Delivery and site handling

3.1 The product is delivered in sealed 25 kg bags on pallets. Each pallet contains 70 bags and weighs 1750 kg.

3.2 The product is a cementitious material and must be stored in dry conditions, off the ground, in a secure store and protected from frost. To avoid 'warehouse set' caused by compaction, the height of bags stacked on a pallet must not exceed one metre and no more than four pallets should be stacked. Renders should be used in the order in which they are received and each delivery should be kept separate to avoid confusion. When stored unopened the product has a shelf-life of 12 months from the date of manufacture.

3.3 The product is classified as 'irritant' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* and must be handled using the routine precautions for Portland cement.

3.4 Each bag bears the Certificate holder's name, batch number and date of production. Each pallet bears the BBA logo incorporating the number of this Certificate.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Insul-Mace.

Design Considerations

4 Use

4.1 Insul-Mace is satisfactory for external use as a two-coat, self-coloured cementitious render system designed to simulate a conventional brickwork finish. It is applied over Insuletics Insul-Base standard base coat render onto suitably prepared exterior substrates of existing cement render or brickwork, blockwork or concrete on new or existing buildings.

4.2 New constructions to be rendered should be designed and constructed in accordance with the relevant recommendations of PD 6697 : 2010, BS EN 1996-2 : 2006 and its UK National Annex, and BS EN 13914-1 : 2005. The designer should select a construction appropriate to its location, paying due attention to design, detailing and workmanship and the materials to be used.

4.3 It is essential that all walls are designed and constructed to prevent moisture penetration and the formation of condensation.

4.4 The assessment covers the area of the wall above damp-proof course level. The product has not been assessed for use:

- on woodwool slabs
- over painted brickwork and similar backgrounds
- on metal lathing
- over timber-frame construction

- over metal-frame construction
- on the backs of parapet and screen walls rendered on the face
- on horizontal surfaces exposed to the weather such as ledges, sills and copings
- as rendering to chimney stacks.

5 Practicability of installation

The product is designed to be installed by a competent, skilled renderer, or a contractor experienced with this type of product.

6 Weather resistance

6.1 The product is suitable for use in areas where the local wind-driven rain index, calculated in accordance with BS 8104 : 1992, is less than 75 litres per m^2 per spell and where two-coat traditional renders would normally be specified.

6.2 Walls to receive an application of the product must be designed and constructed in relation to local exposure conditions to minimise the incidence of rain penetration.

6.3 The product will tend to shed water and will considerably reduce the amount of water absorbed by the substrate during rain.

7 Strength and stability

7.1 The product has adequate resistance to impact damage and cracking.

7.2 In common with traditional similar products, it is essential that the surface to be covered provides a sound mechanical key to ensure a satisfactory bond between the substrate and the render.

8 Water vapour resistance

When tested in accordance with BS EN 1015-19 : 1999, the water vapour permeability coefficient (μ) of Insuletics Insul-Base standard base coat render and Insul-Mace is 0.46* and ≤ 0.30* respectively.

9 Performance in relation to fire

The product is classified as 'non-combustible' as described in the national Building Regulations.

10 Maintenance

Regular maintenance checks should be carried out on architectural details and on external plumbing and fittings to ensure they are functioning correctly and to prevent water penetration into the product.

11 Durability

11.1 The product, applied to a suitable sound substrate over Insuletics Insul-Base standard base coat render, will perform satisfactorily for a period in excess of 30 years.

11.2 The product may be discoloured by water runs and care should be taken to ensure that normal architectural details for shedding water clear of the building are present and functioning, and that gutters and downpipes are in good condition.

11.3 The product may become discoloured with time, the rate depending on the local environment. Appearance can normally be restored by cleaning with water, mild detergent and a stiff bristle brush. In industrial atmospheres light colours should be avoided.

11.4 The product may suffer from algal growth in a similar manner to traditional external rendered finishes.

11.5 In common with traditional renders the product may be subject to lime bloom. The occurrence of this may be reduced by providing adequate protection and avoiding application in winter or in adverse weather conditions. The effect is less noticeable on lighter colours.

Installation

12 General

12.1 Application of Insul-Mace must be carried out strictly in accordance with this Certificate, the Certificate holder's instructions and specifications, and the relevant recommendations of BS EN 13914-1 : 2005.

12.2 The product should not be applied in rain or mist, at temperatures below 5°C or above 35°C, or if exposure to frost is likely to occur during curing. In common with traditional sand/cement renders, the product must not be applied to frost-bound surfaces.

12.3 In sunny weather, work should commence on the shady side of the building and be continued round following the sun to prevent the render drying out too rapidly.

12.4 Wall surface temperatures above 40°C will accelerate the chemical setting of the process and, if the set is too rapid, complete hydration may not be achieved.

12.5 To minimise colour shade variations and avoid dry line jointing, continuous surfaces should be completed without a break. If breaks cannot be avoided they should be made where services or architectural features such as drainpipes, reveals or lines of doors and windows will help mask cold joints. Where long, uninterrupted runs are planned, bags of the material should be checked for batch numbers. Bags with different batch numbers should be checked for colour consistency.

13 Site survey and preliminary work

13.1 Advice concerning site survey and preliminary work is made available to the designer or rendering contractor by the Certificate holder.

13.2 A pre-application survey of the property must be carried out to determine suitability of the substrate to receive the base coat and render coats and to establish whether repairs to the building structure are necessary before application. A specification is prepared for each elevation indicating:

- preliminary treatment of the background
- detailing around windows and doors and at eaves
- exact position of movement joints
- any alterations to external plumbing.
- position of beads
- damp-proof course level
- areas where flexible sealants must be used

13.3 Tests to determine the salt content of brick substrates should be conducted in accordance with BS EN 772-5 : 2001 prior to application of the underlying base coat. Results of the tests are reported to the Certificate holder so that advice on the suitability of the substrate to receive the products can be given.

13.4 Mortar in new masonry must be compatible with the substrate and the product.

13.5 All necessary repairs to the building structure must be completed before application of the underlying base coat.

13.6 It is recommended that external plumbing is removed and, where necessary, alterations made to underground drainage to accommodate its repositioning on the finished face of the installation.

13.7 On existing buildings, purpose-made oversills may be necessary to extend beyond the finished face of the installation. Sills should have an efficient throat or drip on the underside and be designed to prevent water running onto the wall below or into the jambs. New buildings should incorporate suitably wide sills.

13.8 New walls to be rendered should be left as long as possible to minimise substrate movement.

13.9 At the top of walls, the installation must be protected by an adequate overhang or by adequately-sealed purpose-made flashing. The Certificate holder can advise on suitable specifications for particular circumstances.

14 Preparation of substrate

14.1 All damage to the substrate from frost attack, salts or corrosion must be carefully repaired. Damaged bricks or blocks must be replaced and any holes or inadequate joints filled. Loose and spalling render or projecting mortar must be removed, and uneven surfaces levelled to avoid variations in the thickness of the product.

14.2 The relevant recommendations of BS EN 13914-1 : 2005 must be followed to achieve a satisfactory bond of the underlying base coat. In particular, the surface to be rendered must provide a good mechanical key and adequate suction, and be free from paint, oil, soot, efflorescence, dust, lichens, moulds and similar contaminants which may prevent adequate adhesion.

14.3 It is essential that new and existing substrates to be rendered are clean.

14.4 The renders must not be used on water-repellent substrates, on plaster or plaster paint or coatings.

14.5 When the substrate consists of different materials or a material of variable suction, the recommendations of BS EN 13914-1 : 2005 and the Certificate holder's instructions must be followed to ensure even quality and appearance of the finish.

14.6 When applying the underlying basecoat to porous or high suction substrates, particularly in warm weather, the surface should be wetted on the day before the render is applied. A further mist of clean water may be required immediately before application.

14.7 On backgrounds of negligible suction the advice of the Certificate holder should be sought concerning special precautions necessary to provide an adequate key.

14.8 For very smooth or irregular surfaces, the advice of the Certificate holder should be sought.

14.9 Wherever possible, independent scaffolding should be used to avoid the need to subsequently make good putlog holes and other breaks in the work.

14.10 Angles may be formed using PVC or stainless steel angle and stop beads, or using chamfered battens. The Certificate holder can advise on suitable products.

15 Mixing

15.1 The product is added to clean water, at a rate of approximately 4.4 to 5 litres of water per 25 kg of product. It is thoroughly mixed using a drill and paddle or free fall mixer, for a minimum of five minutes, until the correct workability is achieved.

15.2 Where excessive concentrations of dust may accumulate, the measures defined in the Health and Safety Executive Publication EH40/2005 *Workplace exposure limits* for unlisted substances should be adhered to. It should be ensured that the current edition is being followed.

15.3 In common with traditional renders, slumping of the material may occur if the mix is too wet, and will increase the risk of settlement cracks developing.

15.4 The product will remain workable for approximately 45 minutes after mixing. It must not be remixed after it has begun to set.

16 Application

16.1 Render beads and expansion beads are fixed in accordance with the render bead supplier's instructions and the Certificate holder's recommendations.

16.2 Insuletics Insul-Base standard base coat render is applied by hawk and trowel at approximately 15 $kg \cdot m^{-2}$ to 18 $kg \cdot m^{-2}$ to give a thickness of between 8 mm and 10 mm. Before the basecoat has set, a key is formed by scratching the render surface.

16.3 Once the basecoat has initially set, Insul-Mace is applied using traditional methods at between 15 $kg \cdot m^{-2}$ and 20 $kg \cdot m^{-2}$ to give a uniform finish between 8 mm and 10 mm thick.

16.4 After the mortar layer has started to stiffen, but before it has fully set, the contrasting face layer is applied using the same techniques at between 6 $kg \cdot m^{-2}$ and 9 $kg \cdot m^{-2}$ to give a uniform finished thickness of between 3 mm and 5 mm.

16.5 A textured surface finish is immediately applied using a suitable tool such as a brush, comb or spatula to simulate a brick surface.

16.6 The face layer is cut through to the base layer using the appropriate tool to give the appearance of recessed mortar coursing. Spirit levels and straight edges should be employed during this operation.

16.7 At the completion of the cutting process, and after allowing further stiffening of the finished render, any loose material is removed using a soft brush, taking care not to damage the surface.

17 Curing

17.1 The product must be protected from rain, mist or cold (less than 5°C on a falling thermometer) conditions to prevent an excessively prolonged drying period.

17.2 The use of polythene sheeting is recommended during curing. This should hang clear of the face of the wall but be arranged in such a way that it does not form a tunnel through which wind could increase the rate of water evaporation from the product.

17.3 Care must be taken to protect the product from rapid drying due to exposure to direct sun or drying wind to ensure complete hydration of the cement.

18 Finishing

On completion of the installation, the surface must be checked to ensure an even coverage of the brick-effect finish.

19 Repair

Damage to the product should be repaired immediately in accordance with the relevant recommendations of BS EN 13914-1 : 2005 using conventional rendering techniques and materials. The advice of the Certificate holder should be sought for particular installations.

Technical Investigations

20 Tests

20.1 Tests were carried out on the product and results assessed to determine:

- impact resistance
- initial surface absorption
- ash content
- flexural and compressive strength of mortars
- effect of accelerated ageing on bond strength
- density.
- water vapour permeability
- sieve grading

20.2 An evaluation was made of data from independent laboratories relating to fire propagation and surface spread of flame.

20.3 An assessment was made of data to BS EN 998-1 : 2010 for Insuletics Insul-Base standard base coat render and Insul-Mace in relation to:

classification for hardened mortar properties

- compressive strength at 28 days*
- capillary water absorption*
- thermal conductivity*

properties relevant for intended use

- dry bulk density*
- compressive strength at 28 days*
- adhesion*
- capillary water absorption*
- water vapour permeability coefficient*
- thermal conductivity
- reaction to fire*

properties of the fresh mortar

- workable life*
- air content*
- mixing of mortar*.

21 Investigations

21.1 Visits were carried out to installations in progress to assess the practicability of installation.

21.2 Visits were made to existing sites to evaluate the long-term durability of the product in service.

21.3 A survey of known users of the product was conducted.

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

Bibliography

BS EN 772-5 : 2001 *Methods of test for masonry units — Determination of the active soluble salts content of clay masonry units*

BS EN 998-1 : 2010 *Specification for mortar for masonry — Rendering and plastering mortar*

BS 8104 : 1992 *Code of practice for assessing exposure of walls to wind-driven rain*

BS EN 1015-19 :1999 *Methods of tests for masonry — Determination of water vapour permeability of hardened rendering and plastering mortars*

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 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

22 Conditions

22.1 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.

22.2 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.

22.3 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.

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

22.5 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.

22.6 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.

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