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BUILDING PRODUCTS & SYSTEMS

Appraisals

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TECHNICAL ASSESSMENT 357

May 2008

Insulcon Panels

PURPOSE

Insulation and surface cladding of external walls of buildings.

APPLICANT

Insulcon Pty Ltd (ABN 46 098 619 562), 28 Mickle Street, Dandenong, Victoria 3175 (Manufacturer)

Atpolywell Pty Ltd, 7 Butler Street Eumemmerring Victoria 3177 (Distributor)

TECHNICAL OPINION

In the opinion of CSIRO Appraisals, the Insulcon Panel system is suitable for the insulation and weatherproof protection of external walls for buildings up to three storeys, under the following conditions:

1. The system is installed in strict compliance with the Insulcon Panels Installation Manual (May 2007).
2. The system is not installed in an area subjected to tropical cyclones as defined in AS 4055 - 1992 'Wind loads for housing' (Amdt 1 December 1994).
3. Fixing of the Insulcon Panel system is set on 600mm maximum stud spacings except where closer stud spacings are determined by the wind loads.

Fixer spacings for Wind Classification, as defined in AS 4055-2006, 'Wind loads for housing' (Amdt 1 December 1994), are as follows for 450 mm stud spacings:

- Wind Classification N1: Within 1200mm of a building edge at 600mm centres, elsewhere 600mm centres.
- Wind Classification N2: Within 1200mm of a building edge at 400mm centres, elsewhere 600mm centres.
- Wind Classification N3: Within 1200mm of a building edge at 300mm centres, elsewhere 600mm centres.
- Wind Classification N4: Within 1200mm of a building edge at 200mm centres, elsewhere 400mm centres.
- Wind Classification N5: Within 1200mm of a building edge at 150mm centres, elsewhere 250mm centres.
- Wind Classification N6: Not suitable

Fixer spacings for Wind Classification, as defined in AS 4055-1992, 'Wind loads for housing' (Amdt 1 December 1994), are as follows for 600 mm stud spacings:

- Wind Classification N1: Within 1200mm of a building edge at 400mm centres, elsewhere 600mm centres.
- Wind Classification N2: Within 1200mm of a building edge at 400mm centres, elsewhere 600mm centres.
- Wind Classification N3: Within 1200mm of a building edge at 250mm centres, elsewhere 400mm centres.
- Wind Classification N4: Not suitable.
- Wind Classification N5: Not suitable
- Wind Classification N6: Not suitable

4. The system is suitable for buildings up to 2 storeys in height.
5. Use of timber framing must be in accordance with AS 1684.1-1999 'Residential timber-framed construction – Design criteria' and the framing manufacturer's specifications.
6. Insulcon Panel is fire retardant 'M' grade EPS to AS 1366 'Rigid cellular plastics sheets for thermal insulation' Part 3-1992 'Rigid cellular polystyrene - Moulded (RC/PS-M)' (Amdt 1 February 1993).
7. Where the building is required to be protected from concealed subterranean termite entry, the building shall be protected by a termite management system that complies with the requirements of AS 3660.1-2000 'Termite management -New building work'.
8. Insulcon Panels are provided with an alkali resistant impregnated first coat finish that is designed to accept a variety of Rainbow Render TM coatings. Prior to application of base coat render, ensure the surface of the Insulcon Panel is free from contaminants.
9. Insulcon Panel system is suitable for use in Class 1 and 10 buildings provided that it is more than 900mm from the allotment boundary and 1.8m from another building on the same allotment, other than an appurtenant Class 10 building or a detached part of the same Class 1 building.
10. The Technical Assessment has not considered the use of the Insulcon Panels system in bushfire-prone areas.

BUILDING CODE of AUSTRALIA 2007

In the opinion of CSIRO Appraisals, the Insulcon Panel system as described in this Technical Assessment and installed under the conditions listed in the Technical Opinion section of this Technical Assessment will satisfy the performance requirements of Clauses BP1.1, BP1.2, FP1.4, JP1 (as applicable) Volume 1 (Class 2- 9 buildings) and P2.1, P2.2.2, P2.6.1 (as applicable) Volume 2 (Class 1 and 10) of the Building Code of Australia.

Notes:

- (i) The inclusion of this clause with reference to the BCA is aimed at assisting those involved in the design, specifying and building approval/permit process relate the Appraisal to the relevant Performance Requirements of the BCA.
- (ii) Users of this Technical Assessment need to take into account any changes made to the BCA during the term of validity of this Technical Assessment.

RELATED INFORMATION

VALIDITY OF THE ASSESSMENT

Condition:

This Technical Assessment applies only to the use of Insulcon Panel system described herein.

Withdrawal:

This Technical Assessment will be withdrawn or amended if CSIRO Appraisals considers that a change in design or manufacturing quality renders the basis of appraisal invalid, or if reported field experience convinces CSIRO Appraisals of unsatisfactory quality or performance.

Term of Validity:

This Technical Assessment is valid until 31 December 2009. Technical Assessments may be amended during the term of validity. Users of this Technical Assessment should verify that it remains valid and is the current version by checking on the CSIRO Appraisals website: <http://www.cmit.csiro.au/services/appraisals/>.

RELEVANT DOCUMENTS

Standards Australia, AS 4055 - 2006 'Wind loads for housing'.

Standards Australia, AS 4055 - 1992 'Wind loads for housing' (Amdt 1 December 1994),

AS 1366 'Rigid cellular plastics sheets for thermal insulation' Part 3-1992 'Rigid cellular polystyrene - Moulded (RC/PS-M)' (Amdt 1 February 1993).

APPROVED ASSESSMENT EXTRACT

The Insulcon Panel manufactured by Insulcon Pty Ltd (ABN 46 098 619 562), Dandenong, Victoria, is suitable for the insulation and surface protection of external walls of buildings when the conditions listed in CSIRO Appraisals Technical Assessment 357 are fulfilled.

APPRAISAL

DESCRIPTION

The following description is based on information provided by the applicant.

General:

The Insulcon Panel system, is a method of applying insulation to the external walls of buildings and providing a weatherproof protection over the insulation.

The Insulcon Panel system is comprised of M grade styrene panel with an alkaline resistant fibreglass mesh which is embedded in a first coat of Rainbow Render™.

The Insulcon Panel system is installed over timber or metal frames.

Timber framing should comply with AS 1684-1999, 'Residential timber-framed construction – Design criteria'.

Metal framing should comply with AS 3623 – 1993 'Domestic metal framing'.

Specifications:

Insulcon Panel system is an 'M' grade styrene panel with fire retardant additives, manufactured in accordance with AS 1366 'Rigid cellular plastics sheets for thermal insulation' Part 3-1992 'Rigid cellular polystyrene - Moulded (RC/PS-M)' (Amdt 1 February 1993). The sheet comes in sizes:-

- 1200 mm x 2400 mm x 40 mm thick
- 1200 mm x 2400 mm x 75 mm thick
- 1200 mm x 2700 mm x 40 mm thick
- 1200 mm x 2700 mm x 75 mm thick

Panels may be hung either vertically or horizontally. However, panels that are less than 75 mm thick should only be used vertically and always finish on a stud.

Reinforcing is an alkaline resistant mesh.

Screw fixings approved for use are:-

- Class (3) countersunk screws, 10 gauge x 100 mm for use on 75 mm thick Insulcon panels; or
- Class (3) countersunk screws 10 gauge x 75 mm for use on 40 mm thick Insulcon panels.

Jointing and sealing of penetrations and windows. The applicant recommends Sikaflex 1A (PRO).

Design Requirements

Concrete slab

Concrete slabs should be finished with a straight and smooth edge where the panel is expected to overlap.

Stud wall

Insulcon Panels are screwed directly to either timber or metal studs. Spacing of the wall studs needs to be considered in relation to the expected wind load. Insulcon Panels are 1200 mm wide, and stud spacing should be exact division of 1200 mm (e.g. 600 mm) so that each panel can finish on a wall stud.

Ensure adequate framing around windows and doors to allow fixing of the panels. An extra stud is required on internal corners so that both sheets can be fixed.

Electrical penetrations

Electrical power points etc need to have a fixing plate installed to the wall frame prior to sheet installation.

Preparation prior to installation

All windows, doors, flashings, fixing plates are to be installed prior to installation of Insulcon Panels.

Cutting Panels

Panels can be easily cut with a hand saw or power saw fitted with a masonry blade. When cutting sheets ensure that all edges are square so as to ensure there are no gaps when sheets are fitted up against each other.

Installation

Installation instructions are contained in the Insulcon Panels Installation Manual (May 2007).

When two panels meet on a stud, both edges need to be fixed to the stud. A false stud nailed to the existing stud to increase its width may allow enough room to fix both panels.

Panel Layout

Insulcon Panels may be laid either vertically or horizontally, however, panels that are less than 75 mm thick should only be used vertically and always finish on a stud.

The location of joints around windows and door opening should be considered. Avoid joints that coincide with the edge of a window or door to minimise risk of cracking due to movement of the door or window frame.

Corner Beads and Bottom edges

All corners must be protected with an angle bead. Plastic, galvanised steel or stainless steel angles are recommended. The bead is fixed to the corner using a non-solvent based adhesive. The applicant recommends adhesive such as 'Zero Nails'. Plastic angles must be primed using plastic primer such as Insul Prime prior to application of render as render will not adhere to un-primed plastic.

Jointing and sealing

Proper sealing of all penetrations including around windows and doors is imperative to ensure water does not reach the finished wall cavity. Insulcon recommends Sika Flex PRO. Sealant bead should be no less than 8 mm. Sealant should be left to cure for 24 hours prior to application of render.

All joints, including corners must have 200 mm wide jointing mesh applied and then coated with Rainbow Patch which is allowed to cure. When running mesh up to corner beads, apply the mesh to overlay the edge of the bead but not onto the bead corner.

Masking

All windows, doors, floors etc should be masked using vinyl tape (5-7mm away from panels) prior to Rainbow Render to avoid unwanted render.

Accidental render on other surfaces can be removed by immediately rinsing well with water.

Base Coat Render

Prior to application of base coat render, ensure the surface of the Insulcon Panel is free from contaminants.

Exposed styrene edges can develop yellow film if left exposed. Remove film prior to render. These exposed areas should then be coated with Rainbow Patch or Rainbow Render with Rainbow Bond added to it. Use of standard render over raw styrene will result in delaminating of the render.

Base coat render is applied to minimum thickness of 5 mm depending on finish required.

Texture finishes

A wide range of texture finishes can be applied. Contact Insulcon for full range of suitable Rainbow Render coatings.

DESIGN INFORMATION

General:

Based on information from the applicant, the Insulcon Panel system is a method of applying insulation to the external walls of buildings and providing weatherproof protection over the insulation.

Design considerations:

According to the applicant, Insulcon consists of an expanded polystyrene sheet mechanically fixed to a framed wall. Sheet joints are reinforced by treated fibreglass mesh bonded with a render. A minimum 5mm thick render is applied over the expanded polystyrene sheets.

Durability:

CSIRO Appraisals has not assessed the durability of Insulcon System. It is expected to have a durability equivalent to other polystyrene claddings currently in use in Australia.

BASIS OF APPRAISAL

CSIRO Appraisals has assessed the following aspects in undertaking this appraisal:

- (a) installation procedures,
- (b) the bonding of the system on to the substrate,
- (c) the durability of the system,
- (d) the ability of the system to resist impact loadings and
- (e) the fire performance of the system.

The following documents and inspections were used in carrying out the appraisal.

Manufacturer's Information

1. **Insulcon Pty Ltd, 26 Mickle Street, Dandenong, Victoria 3175. Insulcon Panels Installation Manual (May 2007):**
Instructions for installation of Insulcon Panels.
2. **Insulcon Pty Ltd, 26 Mickle Street, Dandenong, Victoria 3175. Work procedure rendering panels (May 2007):**
Procedures for applying texture/render on to Insulcon Panels.
3. **Insulcon Pty Ltd, 26 Mickle Street, Dandenong, Victoria 3175. Rainbow Render and Rainbow Texture Application Guide (May 2007):**
Procedure for application of Rainbow Render and Rainbow Texture.



Kenneth KJ Lofhelm
CSIRO Appraisals

Reports:

1. **CSIRO Sustainable Ecosystems, Graham Road, Highett, Victoria 3190, Report No USP(C)2007/005 (June 2007) Insulcon Cladding Bending, Shear and Fastener Testing:** This reports provide results of testing of the Insulcon system for the structural strength of the mechanical fastening system used to fasten the expanded polystyrene boards to the framing system. They outline the fastener spacings for studs spaced at 450 mm and 600 mm centres.

Note: Outdoors exposure testing and in field use are the only reliable means of obtaining information about the durability of materials in terms of their continuing satisfactory performance. Such testing takes a long time. CSIRO Appraisals does not consider it warranted to await results from such tests before issuing an appraisal. This appraisal is based on laboratory assessments, inspections and the history of completed installations.

Inspection:

Representatives of CSIRO Appraisals have inspected installations of this system and found them to be satisfactory.



CSIRO Appraisals is a project of CSIRO Manufacturing and Infrastructure Technology providing a range of assessment products including:

- Technical Assessments – appraisals of innovative products, systems or materials that may or may not be covered by Australian Standards or building regulations.
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- Certification Assessments – appraisals of products, systems or materials solely against the requirements of the BCA and used for gaining approval from Federal or State authorities.

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H. RELATED DOCUMENTS**J. OTHER/OPTIONAL INFORMATION****14. ABSTRACT** *(CSIRO Appraisals Approved Assessment Extract)*

The Insulcon Panel manufactured by Insulcon Pty Ltd (ABN 46 098 619 562), Dandenong, Victoria, is suitable for the insulation and surface protection of external walls of buildings when the conditions listed in CSIRO Appraisals Technical Assessment 357 are fulfilled.