

Copyright © Agrément South Africa, 2000 (2005 edition)

Subject:
Isoboard® Cavity Wall Insulation

The master copy of this document appears on the website:

<http://www.agrement.co.za>

Validity

Users of any Agrément certificate should check its status: all currently valid certificates are listed on the website. In addition, check whether the certificate is [Active](#) or [Inactive](#).

The certificate holder is in possession of a confirmation certificate attesting to his status.

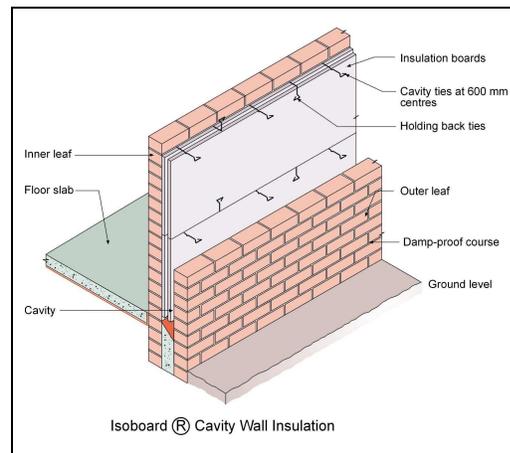
SANS 10400 – 1990 the application of the National Building Regulations

Quick guide

Contents	page 3
Preamble	page 4
Conditions of certification	page 5
Assessment	page 6
Compliance with the National Building Regulations	page 6
Technical description	page 9

P O Box 395 Pretoria 0001
Telephone 012 841 3708
Fax 012 841 2539
e-mail agrement@csir.co.za
<http://www.agrement.co.za/>

Certificate holder:
Isofoam (South Africa) (Pty) Ltd
P O Box 3804 TYGER VALLEY 7435
Telephone: (021) 930 5074 Fax: (021) 930 5075
e-mail: southsales@isoboard.com
web site: www.isoboard.co.za



Use

The certificate covers the use of the Isoboard® cavity wall insulation in buildings in all areas of South Africa

- as a complete or partial fill board to reduce the thermal transmittance of cavity walls with masonry inner and outer leaves
- when installed by competent contractors in accordance with the certificate holder's instructions

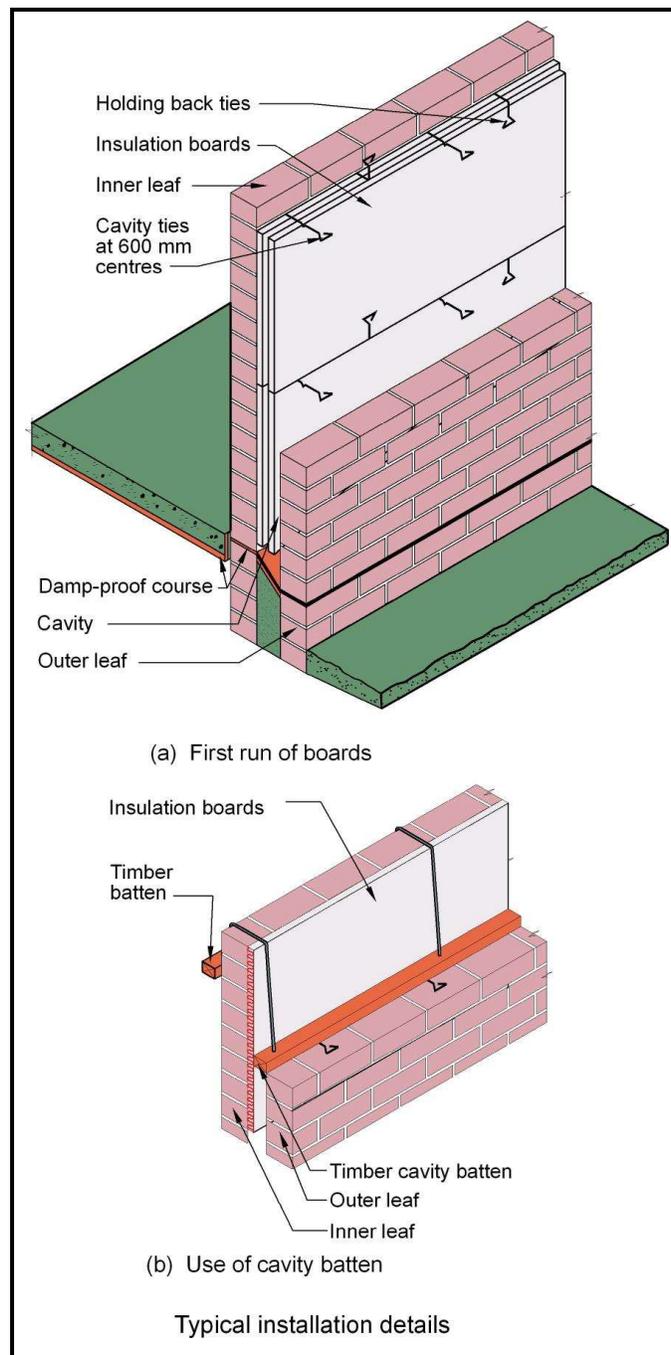
This certificate and Agrément South Africa's assessment apply only to Isoboard® cavity wall insulation that is manufactured and installed as described and illustrated in this certificate, and where the terms and conditions of certification are complied with.

General description

The Isoboard® cavity wall insulation comprises of an extruded polystyrene rigid foam board which is:

- pigmented white or blue
- 600 mm wide
- manufactured in thicknesses of 30, 40, and 50 mm
- manufactured in standard lengths of 1250 mm or 2500mm.

The edges of the boards are profiled for shiplapping.



CONTENTS

PREAMBLE

PART 1: CONDITIONS OF CERTIFICATION

PART 2: ASSESSMENT

Table 1: Compliance with National Building Regulations

Table 2: Assessment

PART 3: TECHNICAL DESCRIPTION

General description

Manufacture

Delivery and site storage

Installation

Table 3: Physical properties of 30 mm thick Isoboard®

Table 4: Spacing of walls ties for various cavity widths

Table 5: U values for cavity walls finished externally in plaster and incorporating different thicknesses of Isoboard®

Table 6: U values for fair faced cavity incorporating a 50 mm residual cavity and different thicknesses of Isoboard®

Technical support

PREAMBLE

This certificate is issued by Agrément South Africa in terms of the powers granted to it by the Minister of Public Works. This certificate:

- has been granted after a technical appraisal of the performance of Isoboard® cavity wall insulation for the [uses](#) covered by the certificate,
- is independent of any patent rights that may or may not subsist in the subject of the certificate,
- does not relieve the certificate holder from the obligation to obtain the prior approval of the building authority concerned for the use of the subject.

Agrément South Africa considers that the quality and performance of the Isoboard® cavity wall insulation will be satisfactory provided that the requirements stipulated in this certificate are adhered to. However, Agrément South Africa does not on behalf of itself, or the State, or any of its employees or agents guarantee such quality or performance.

Responsibility for compliance with the requirements of this certificate and the quality of the finished product resides with the certificate holder.

No action for damages, or any other claim whatsoever, lies against Agrément South Africa, its members, the State or any of its employees should the said components and materials fail to comply with the standard set out in this certificate.

Building authorities or users who are in any doubt about any detail or variation, should contact [Agrément South Africa](#).

The validity of this certificate is reviewed every three years. The certificate shall remain valid as long as Agrément South Africa is satisfied that:

- the certificate holder complies with the general and specific conditions of certification and the technical requirements stipulated in the certificate
- the performance-in-use of the subject is acceptable
- any changes in building legislation, regulations, relevant standards or Agrément performance criteria have not invalidated the technical assessment which formed the basis of certification.

Agrément South Africa reserves the right to withdraw the certificate at any time, should reasonable cause exist.

Notices affecting the validity of this certificate will be published in the Government Gazette.

PART 1: CONDITIONS OF CERTIFICATION

Licensee - any person or company appointed by the certificate holder and registered with Agrément South Africa to manufacture Isoboard® cavity wall insulation in accordance with this certificate and authorised by him to claim compliance with the certificate. It is the certificate holder's responsibility to ensure that the licensee carries out the works in compliance with this certificate and in accordance with the approved quality system.

This certificate covers the use of Isoboard cavity wall insulation when it:

- is manufactured and supplied by
 - the certificate holder or
 - a licensee
- is installed in accordance with [Part 3](#) below, and the certificate holder's Installation Manual
- complies with the Conditions of Certification.

Any changes to the production process or the material formulation or the method of installation could result in various aspects of the performance of this product no longer complying with Agrément performance criteria. Any change not authorised by Agrément South Africa in writing prior to its implementation will invalidate this certificate and the certificate can then not be used to demonstrate compliance with National Building Regulations.

Isoboard® cavity wall insulation

Tested and approved fit for purpose when manufactured and installed as specified in

CERTIFICATE 2000/276



Republic of South Africa. *National Building Regulations*, Government Notice No R. 2378, Government Gazette No 12780, Pretoria, South Africa, 12 October 1990.

General conditions

Marking

The product packaging must be suitably marked with Agrément South Africa's identification logo together with the number of this certification.

Validity

The validity of this certificate is subject to the continued participation of the certificate holder in Agrément South Africa's post-certification quality management scheme.

Reappraisal

- must be requested by the certificate holder before making changes to the product
- will be required by Agrément South Africa if there are changes to the National Building Regulations or the Agrément criteria which affect the subject

This certificate may be withdrawn if the certificate holder or a registered licensee fails to comply with these requirements.

On behalf of the Board of Agrément South Africa

Signed

Chairman

PART 2: ASSESSMENT

Scope of assessment

The conventional aspects of the construction are subject to the rules of good building practice (typically as described and illustrated in Agrément South Africa's [Supplement to certificates](#) and in the *Home building manual Parts 1, 2 & 3* issued by the National Home Builders Registration Council), and must comply with the National Building Regulations.

This assessment applies to those innovative aspects of using Isoboard cavity wall insulation described in [Part 3](#) of the certificate. It also applies to those conventional aspects of the wall construction which, in the opinion of Agrément South Africa, are influenced by the innovative aspects.

The innovative aspects referred to are:

- the use of insulation board to decrease the thermal transmittance of cavity walls
- the spacing of the wall ties to accommodate the board sizes.

This assessment is based on:

- documentation provided by the client
- inspections of the applicant's factory and completed installations
- known behaviour of the materials used in the product
- the certificate holder's quality management system
- work done by British Board of Agreement on similar products.

Assessment

In the opinion of Agreement South Africa, Isoboard® Cavity Wall Insulation is suitable for the uses [specified](#) on page 1, in all regions of South Africa.

The performance in use of Isoboard® cavity wall insulation installations will be such that the Isoboard® cavity wall insulation will satisfy:

- Agrément South Africa's performance criteria and requirements for durability
- the relevant requirements for safety and health prescribed by Agrément South Africa

Agrément South Africa's detailed comments on the various aspects of performance of the insulation are set out in Tables 1 and 2 below. Each aspect of performance was assessed by experts in that field.

Compliance with National Building Regulations

Where applicable, the performance of the cavity wall insulation relates to the National Building Regulations as set out in Table 1. Any national building regulation not specifically referred to is considered to be outside the scope of this certificate and must be applied by the local authority in the normal manner.

Republic of South Africa. National Building Regulations, Government Notice R. 2378, Government Gazette No 12780, Pretoria, South Africa, 12 October 1990

Table 1: Compliance with National Building Regulations

Aspects of performance	Opinion of Agrément South Africa	National Building Regulations satisfied
Materials	Satisfactory. The physical properties of Isoboard® have been determined in accordance with ISO standards	The materials used in the Isoboard® cavity wall insulation are deemed to satisfy the requirements of regulation A13 (1) (a): Administration.

Table 2: Assessment

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Resistance of insulated walls to water penetration and ground moisture	Satisfactory in properly designed and built walls. Because of the nature of joints between adjacent boards, Isoboard® cavity wall insulation must not be relied on to prevent the passage of moisture through walling.	Isoboard® does not absorb water by capillary action and may therefore be used in situations where it bridges the damp-proof membrane of the inner or outer leaf. Where adhesive is used to attach insulation boards to the inside leaf of cavity walls, adhesive may bridge the damp-proof membrane and in this instance the board should not be continuous across the damp-proof membrane entirely. The use of Isoboard® does not preclude the need to apply an external render coat or other suitable finish should such coat or finish normally is required. Where the outer leaf of a wall is of face brick construction, attention must be paid to the proper filling and finishing of mortar joints as would be the case with all face brick construction.
Behaviour in relation to fire	Satisfactory. Although Isoboard® is a combustible material in terms of SANS 10177: Part V it is unlikely to ignite within the wall cavity.	In order to prevent the movement of hot gases and toxic fumes between defined fire rated compartments cavities must be bricked closed around the perimeters of these compartments [both horizontally and vertically] and at window, door, vent or any other service opening. <div style="border: 1px solid green; padding: 5px; margin-top: 10px;">SANS 10177: Part V, Fire testing of materials, components and elements used in buildings</div>
Structural Strength of insulated walls	Satisfactory. Isoboard® does not serve a structural function in walls. For structural purposes the width of the cavity is taken as the width of the board and any residual cavity. Where the width of this cavity exceeds the deemed-to-satisfy rules of National Building Regulations, a rational design is required.	Wall tie spacing as required in Table 6 of this certificate does not meet the requirements of the National Home Builders Registration Council mainly because of increased vertical tie centres to accommodate the 600 mm width of Isoboard® cavity insulation. It is, however, assessed that adequate tie densities per square metre have been achieved by reducing horizontal tie centres accordingly. <div style="border: 1px solid green; padding: 5px; margin-top: 10px;">SANS 10164: Part 1, the structural use of masonry: Unreinforced masonry walling</div>

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Durability	Satisfactory. Isoboard® will be durable and effective for the life of the building in which it is installed	Isoboard® cavity wall insulation is rot proof, offers no food value to vermin and will not support mould or fungal growth.
Thermal performance	Satisfactory. Agrément South Africa recommends that for design purpose a conductivity value of 0,030 Wm ⁻¹ K ⁻¹ be adopted for South Africa summer and winter conditions,	<p>Isoboard® is effective as a cavity wall insulating material. However, the conductivity of Isoboard® has the potential to increase over a period of years due to the effect of:</p> <ul style="list-style-type: none"> • migration of gases • absorption of water as a result of: <ul style="list-style-type: none"> ○ submersion in water ○ water vapour diffusion ○ freeze-thaw cycling. <p>The U values for typical cavity wall configurations are shown in Tables 5 and 6 and may be used in transient calculation methods like the Transfer Function Method (TFM) developed by ASHRAE or other similar methods.</p> <div data-bbox="938 863 1321 1045" style="border: 1px solid green; padding: 5px; margin: 10px 0;"> <p><i>Transfer Function Method: developed by ASHRAE-Handbook, Fundamentals Volume, American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc, Atlanta. GA 1989</i></p> </div>
Quality management	The certificate holder's quality management scheme complies with Agrément South Africa's requirements. Properly applied, it will ensure that quality in the manufacture of Isoboard® will be consistently maintained.	Agrément South Africa's requirements are based on SANS 9001: 2000

SANS 9001:2000 Quality management systems-Requirements'

PART 3: TECHNICAL DESCRIPTION

General description

Isoboard® cavity wall insulation is an extruded polystyrene rigid foam board made in various thicknesses and with edge profiles to suit cavity wall insulation applications. Isoboard® cavity wall insulation is installed during the construction of walls by competent contractors and is for use as a complete or partial fill board to reduce the thermal transmittance of cavity walls with masonry inner and outer leaves.

In areas of the country where cavity wall construction is a requirement, provision is made for a minimum residual cavity of 50 mm. The Isoboard® is firmly attached to the inside skin of the cavity wall and care must be taken that:

- the cavity is clear of mortar droppings
- the cavity ties incorporate effective drips
- damp-proof membranes are installed in accordance with the recommendations of SANS 10021.

In areas of the country where cavity wall construction is not required, no residual cavity is necessary.

The physical properties of 30 mm thick Isoboard® cavity wall insulation are set out below in Table 3.

Table 3

Property	Standard	Value
Density	ISO 845: 1988	36,1 kg/m ³
Compressive strength	ISO 844: 1978	0,310 MPa
Water vapour permeability	ISO 1663: 1981	0,78 ng/Pa.s.m
Water absorption	ISO 2896: 1987	0,26% by volume
Coefficient of linear thermal expansion	ISO 4897: 1985	67x10 ⁻⁶ per °C
Thermal conductivity (average of two tests)	ISO 8302: 1991	0,024 W/mK (refer to Table 2 for recommended design value)

Manufacture

Isoboard® cavity wall insulation is manufactured by Isofoam (South Africa) (Pty) Ltd in its factory in Atlantis Industrial. Isofoam SA (Pty) Ltd distributes the products.

Delivery and site storage

The boards are delivered to site in packs wrapped in light coloured, translucent plastic sheets which carries the identification

symbol of Agrément South Africa as illustrated and with handling instructions.

Isoboard® must be stored flat in covered areas away from direct sunlight and ultra-violet light. Care must be taken to prevent boards coming into contact with solvents and materials containing volatile organic components which will have adverse effects on the polystyrene.

Boards must not be exposed to naked flame or other heat sources. They should not be stored near materials such as packaging paper, waste and flammable liquids.

Care is required during handling to prevent damage to the face and tongued-and-grooved and to avoid pitting or other surface damage and when cleaning the boards with high-pressure water jets.

Advice on recommended water pressures and the distance of the nozzle from the board, if applicable, suitable cleaning agents and disinfectants should be obtained from the certificate holder.

Installation

The masonry walls are constructed leading with either the inner or outer leaf. Where a residual cavity is specified it is recommended that the inner leaf be constructed ahead of the leading leaf. Fixing the boards in this way gives enhanced thermal performance.

Boards are fixed to the cavity face of the leading leaf with wire ties which are additional to the specified cavity ties. These additional ties may be either 2 mm diameter L-shaped galvanised wire or standard cavity ties and are installed at the same height and midway between the specified cavity ties. Boards are held in place during installation while these additional ties are bent against the boards. Alternate ties are bent up and down to secure the upper and lower edges of boards.

The installation procedure is as follows:

- a section of leading leaf built with wall ties in position. The first row of ties is placed with consideration being given to the required height of the first lift of insulation
- excess mortar is removed from the cavity face of the leading leaf and the insulation board is attached firmly to this face with wire ties as described above. The shiplap edges of boards below are carefully notched where necessary to accommodate the ties
- after the installation of the first row of insulation boards, erection of the leading leaf continues ensuring that the exposed shiplap edges of the boards below are kept free of mortar
- after a few rows of insulation board have been placed, the building of the second leaf proceeds ensuring that where a residual cavity is required, the cavity ties and cavity itself are kept clear of mortar droppings
- the leading leaf is progressively added to, insulation board installed and the second leaf added to, as described above, until the full wall height has been reached.

The horizontal spacing of the cavity ties must suit the thickness of wall leaves and cavity widths. Ties are installed at vertical spacings of 600 mm and coincide with the horizontal joints of insulation boards. Adjacent to window and door openings, and at control joints where these are provided, the vertical spacing of cavity ties must be reduced to 300 mm. Insulation must be carefully cut to accommodate these ties. Care must be taken during installation of boards not to loosen the cavity ties embedded in mortar joints.

The use of cavity boards and battens helps to keep cavity ties and the exposed top edges of the boards clear of mortar droppings.

Boards may be cut to fit around window or door openings, etc by using a sharp knife or a fine-toothed saw. Cut pieces of board are to completely fill the spaces for which they were intended with no gaps left in the insulation. These cut pieces must also be well glued in position.

Installation requirements

Brick or block gauges are to be set such that cavity ties occur at 600 mm vertical spacings to coincide with the horizontal joints of the wall insulation.

Cavity ties must be embedded to a depth of at least 50 mm in the mortar joints of each leaf. Single-wire type Z-ties with central dished drips as well as crimped wire ties may not be used.

Acceptable wall tie types for cavity widths not exceeding 75 mm (thickness of Isoboard® plus residual cavity, if present) are:

- butterfly
- modified PWD
- double triangle
- vertical twist

Where cavities exceed 75 mm in width, only vertical twist ties may be used. The material used to make these ties must have a stiffness equivalent to hoop iron (mild steel 20 mm wide and 4 mm thick). In addition to the above requirements, cavity ties must meet the requirements of SANS 28.

Table 4 shows the spacing of wall ties for various cavity widths.

Table 4

Horizontal spacing of wall ties	Width of cavity
660 mm	50 mm - 75 mm
550 mm	75 mm - 100 mm
330 mm	100 mm - 150 mm

Horizontal spacing of ties with vertical spacing set at 600 mm in order to comply with the tie density requirements of Table 7 of SANS 10164 (Nominal thickness of each leaf 90 mm or more). Additional ties are required at vertical spacings not exceeding 300 mm, near the sides of openings and at discontinuities in the masonry such as at doors, windows and control joints.

SANS 28 Metal ties for cavity walls

Boards must be secured against the inner leaf of the wall with the shiplap joint arranged to shed water away from the inner leaf. (See figure1).

Debris and mortar is to be removed from the cavity and mortar is to be removed from the exposed edges of installed boards as work proceeds.

Boards must be tightly interlocked with no gaps occurring at the top and bottom of the wall, at corners and around windows and other openings.

Typical U values ($Wm^{-2}K^{-1}$)

Table 5 shows the calculated U values for cavity walls finished externally with plaster with the cavity filled with different thicknesses of Isoboard®.

Table 5

Wall construction	U value ($Wm^{-2}K^{-1}$)		
	30 mm	40 mm	50 mm
110 mm wide stock brick external leaf with plaster finish and with cavity insulation, and 110 mm wide stock brick internal leaf	0,69	0,56	0,48
110 mm wide concrete brick external leaf with plaster finish with cavity insulation, and 110 mm wide stock brick internal leaf	0,63	0,52	0,45
110 mm wide concrete brick external leaf finished with plaster and with cavity insulation, and 110 mm wide concrete brick internal leaf	0,58	0,49	0,42

Tables 5 and 6 -
a thermal conductivity value of $0,030 Wm^{-1}K^{-1}$ has been assumed for Isoboard® [See Table 2 Thermal performance].

Table 6 shows the calculated U values for fair faced masonry walls incorporating a 50 mm residual cavity and different thicknesses of Isoboard®.

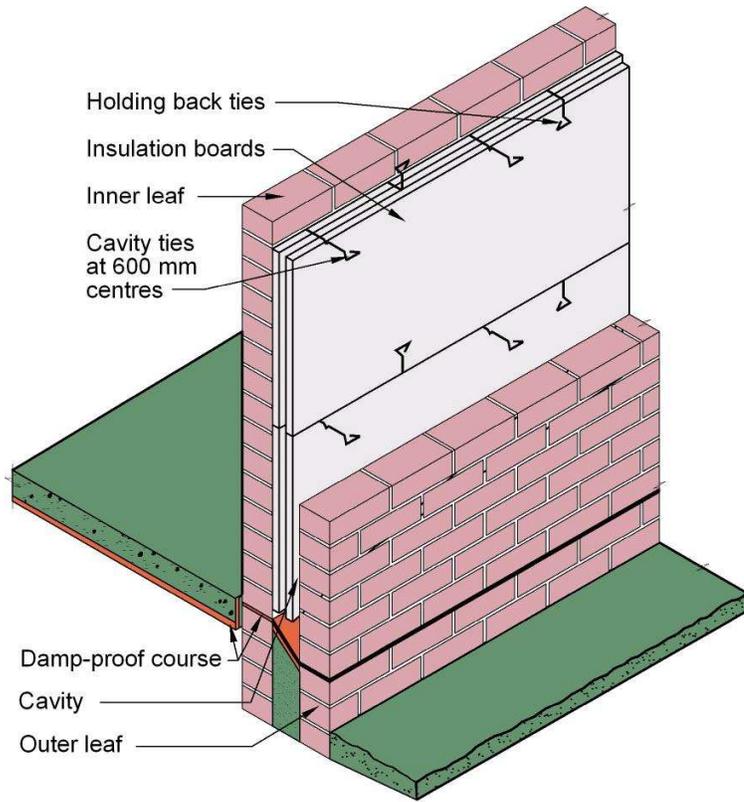
Table 6:

Construction	U value ($Wm^{-2}K^{-1}$)		
	30 mm	30 mm	30 mm
110 mm wide face brick external leaf with 50 mm residual cavity and insulation, and 110 mm wide stock brick internal leaf	0,62	0,52	0,44
110 mm wide concrete brick external leaf with 50 mm residual cavity and insulation, and 110 mm wide stock brick internal leaf	0,57	0,48	0,42
110 mm wide concrete brick external leaf with 50 mm residual cavity and insulation, and 110 mm wide concrete brick internal leaf	0,53	0,45	0,39

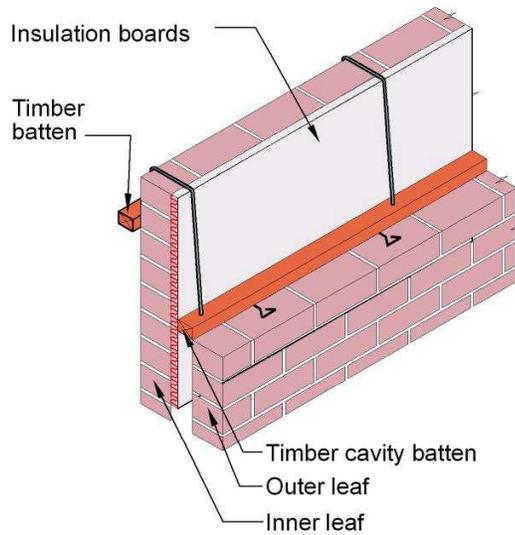
Technical support

Isofoam (South Africa) (Pty) Limited offers technical support from Isoboard® sales offices in Cape Town, Pretoria, Johannesburg and Durban.

This technical support includes *installation manuals* and guidance regarding expected thermal performance, using dynamic thermal simulation tool (Isofoam Toolbox), and in the selection of the correct thickness of board to use to achieve specific conditions or energy usage inside buildings.



(a) First run of boards

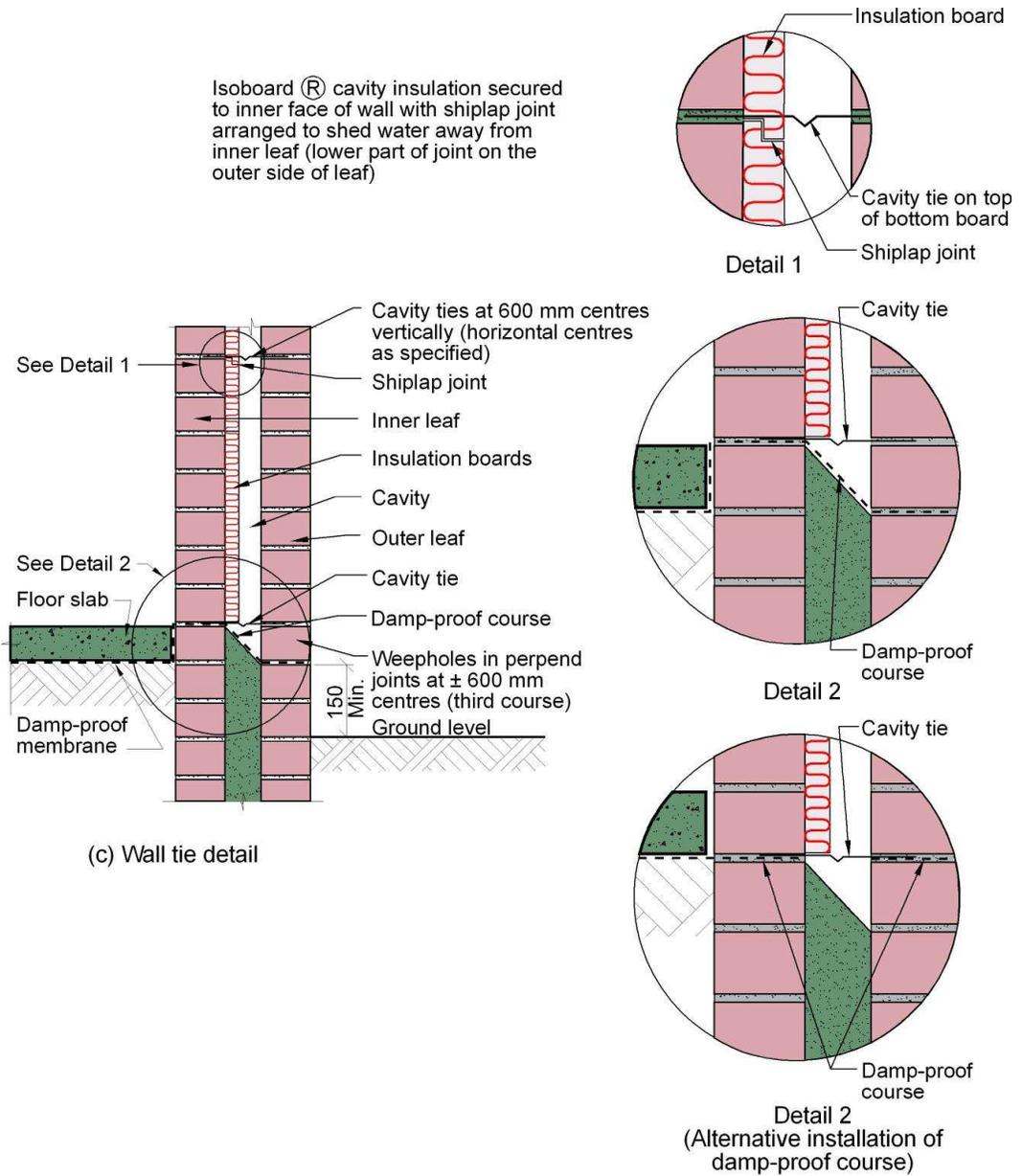


(b) Use of cavity batten

Figure 1

Typical installation details

Isoboard® cavity insulation secured to inner face of wall with shiplap joint arranged to shed water away from inner leaf (lower part of joint on the outer side of leaf)



(c) Wall tie detail

Figure 2

Typical details showing Isoboard® Cavity Wall Insulation