Agrément Certificate 2006/323

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/her status.

Quick guide

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Subject:
IsoBoard® Nail Up Insulated Ceilings

Certificate holder:
Isofoam (South Africa) (Pty) Ltd

P O Box 3804 TYGER VALLEY 7536
Telephone: 021 930-5074 Fax: 021 930-5075
e-mail: southsales@isoboard.com
web site: www.isoboard.co.za

Use

The certificate covers the manufacture and installation of IsoBoard® Nail Up Insulated Ceilings in new or renovated buildings of all occupancies.

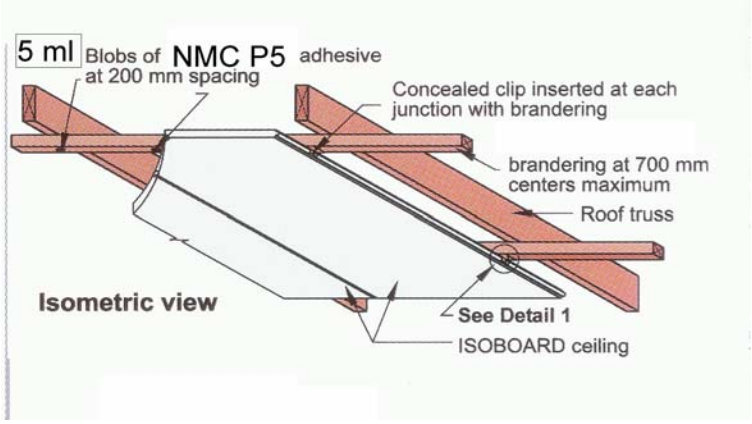
This certificate and Agrément South Africa's assessment apply only to IsoBoard® Nail Up Insulated Ceilings that are manufactured and installed as described and illustrated in this certificate, and where the terms and conditions of certification are complied with.

The certificate specifically excludes the use of IsoBoard® Nail Up Insulated Ceilings when used in conjunction with any other facing material, whether combustible or non-combustible. Such use must be subject to a satisfactory report on fire tests conducted on the combination of the materials.

General Description

IsoBoard® Nail Up Insulated Ceilings are extruded polystyrene rigid foam boards which are fixed to the underside of timber ceiling brandering or cold formed galvanized steel sections or roof rafters by means of concealed fixing clips, screws and adhesives. IsoBoard® Nail Up Insulated Ceiling boards are:

- white in colour
- 600 mm wide with the longitudinal edges of the boards tongued-and-grooved to facilitate interlocking once installed. The exposed longitudinal edges of boards are also bevelled. Boards may also be supplied with longitudinal grooves cut in their surface at 100 mm centres (IsoPine)
- manufactured in standard thicknesses of 25, 30 and 40 mm
- supplied in standard lengths of up to 8 m.



Ceiling boards are supplied in packs wrapped in white coloured, translucent plastic sheets.

CONTENTS

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 the IsoBoard® Nail Up Insulated Ceilings 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® Nail Up Insulated Ceilings, including adhesive and fixings, 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 manufactured ceiling board 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® Nail Up Insulated Ceilings in accordance with this certificate and authorized by him to claim compliance with the certificate. It is the certificate holder's responsibility to ensure the licensee manufactures the products in accordance with the approved quality system.

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

Isoboard® Nail Up Insulated Ceilings

Tested and approved fit for purpose for use as Nail Up Insulated Ceilings when used as specified in

CERTIFICATE 2006/323

AGRÉMENT SOUTH AFRICA
innovative construction product assessments

This certificate covers the use of IsoBoard® Nail Up Insulated Ceilings when:

- manufactured and supplied by
  - the certificate holder or
  - a licensee appointed and registered as such with Agrément South Africa.
- installed in accordance with Part 3 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 criteria. Any change not authorized 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 the National Building Regulations.

General conditions

Marking

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

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 system.

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.

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.

Chairman

April 2006

PART 2: ASSESSMENT

Scope of assessment

This assessment applies to those innovative aspects of IsoBoard® Nail Up Insulated Ceilings as described in Part 3 of the certificate.

The innovative aspects are:

- the use of extruded polystyrene rigid foam board as a thermally insulating ceiling material
- the method of fixing the ceiling boards to the underside of timber ceiling brandering, roof rafters or cold formed galvanized steel sections with concealed mechanical clips and adhesive, and
- the spacing of ceiling brandering

This assessment is based on:

- documentation provided by the client
- inspection of the applicant's factory and completed installations
- tests carried out on the system
- the certificate holder's quality management system

Assessment

In the opinion of Agrément South Africa, IsoBoard® Nail Up Insulated Ceilings as described in the certificate are suitable for use in new or renovated buildings of all occupancies.

The performance in use of IsoBoard® Nail Up Insulated Ceilings will be such that it will satisfy:

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

Agrément South Africa's detailed comments on the various aspects 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

The innovative aspects of the IsoBoard® Nail Up Insulated Ceilings relate to the National Building Regulations as set out in Table 1. Any 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.

Table 1: Compliance with the National Building Regulations

<table>
<tr><th>Aspects of performance</th><th>Opinion of Agrément South Africa</th><th>Compliance with the National Building Regulations</th></tr>
<tr><td>Materials</td><td>Satisfactory. The physical properties of IsoBoard® Nail Up Insulated Ceilings have been determined in accordance with international standards</td><td>The materials used in the IsoBoard® Nail Up Insulated Ceilings are deemed to satisfy the requirements of regulation A13 (1) (a): Administration.</td></tr>
<tr><td>Behaviour in relation to fire

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</td><td>Satisfactory.
Although IsoBoard® is considered to be combustible in terms of SANS 10177: Part V, it may be used in ceiling applications for all occupancies. In the case of occupancies other than detached dwellings (H4) cognizance must be taken of SANS 10400 Part T clause TT13 Ceilings.

SANS 10177: Fire testing of materials, components and elements used in buildings</td><td>Comments made in Supplement to certificates must be taken into account when building plans are scrutinised by local authorities to check compliance with Regulations T1 (1) (a), T1 (1) (d) with regard to spread of smoke, and T1 (1) (e).
With regard to combustibility and fire properties, IsoBoard® has been classified as follows:
<table>
<tr><td colspan="2">Combustibility</td><td></td></tr>
<tr><td>A</td><td>Non-combustible</td><td></td></tr>
<tr><td>B</td><td>Combustible</td><td>√</td></tr>
<tr><td colspan="2">Surface fire properties</td><td></td></tr>
<tr><td>1</td><td>No flame spread</td><td>√</td></tr>
<tr><td>2</td><td>Low flame spread (no flaming droplets or burning brand)</td><td></td></tr>
<tr><td>3</td><td>Low flame spread (with flaming droplets or burning brand)</td><td></td></tr>
<tr><td>4</td><td>Average flame spread (no flaming droplets or burning brand)</td><td></td></tr>
<tr><td>5</td><td>Average flame spread (with flaming droplets or burning brand)</td><td></td></tr>
<tr><td>6</td><td>Rapid fire spread</td><td></td></tr>
<tr><td colspan="2">Material application</td><td></td></tr>
<tr><td>H</td><td>Horizontal</td><td></td></tr>
<tr><td>V</td><td>Vertical</td><td></td></tr>
<tr><td>H&V</td><td>Horizontal & Vertical</td><td>√</td></tr>
</table>
</td></tr>
</table>

Table 2: Assessment

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Thermal performance	Satisfactory. Agrément South Africa recommends that for design purposes a thermal conductivity value of 0,030 $Wm^{-1}K^{-1}$ be adopted for South African summer and winter conditions.	IsoBoard® is effective as an insulated ceiling. Its thermal conductivity will, however, increase slightly over time as a result of: • migration of gases • absorption of water as a result of water vapour diffusion and exposure to free water. A theoretical assessment using Agrément South Africa's computer simulation indicates that by replacing the standard uninsulated 6,4 mm gypsum plasterboard ceiling in the Agrément Standard House of 53 m^2 with 25 mm thick IsoBoard® Nail Up Insulated Ceilings: • the maximum summer temperatures will drop by between 1 and 2°C , and • winter heating energy requirements will be reduced between 25 and 40%
Condensation	Satisfactory.	Condensation is unlikely to occur on the underside of IsoBoard® Nail Up Insulated Ceilings and the overall improved thermal performance of the building will reduce the occurrence of condensation on walls.
Ability of IsoBoard® Nail Up Insulated Ceilings to resist self weight and possible wind suctions	Satisfactory.	Short-term laboratory tests on IsoBoard®, accelerated testing on adhesives and inspections of completed installations indicate that the specified maximum spans together with the specified method of fixing is sufficient to resist the effects of self weight and likely wind suction.
Durability	Satisfactory. Subject to normal use, a useful life of at least 10 years can reasonably be expected of these ceilings.	IsoBoard® is rot-proof, offers no food value to vermin and will not support mould or fungal growth, however, it can be affected by ultra-violet light, excessive temperature build-up, solvents and materials containing volatile organic components. IsoBoard® Nail Up Insulated Ceilings are vulnerable to impact damage and vandalism. Accelerated aging tests (representing approximately two and a half years of service in the field) show a slight improvement in strength of the adhesive.

Table 2: Assessment (continued)

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Quality management	The certificate holder's quality scheme complies with Agrément South Africa's requirements. Properly applied it will ensure that quality of manufacture 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

ISO 845:1988 *Cellular plastics and rubbers-Determination of apparent (bulk) density on wire-cut samples*

ISO 844:*1978 Cellular plastics-Compression test for rigid materials*

ISO 1663:1981 *Cellular plastics-Determination of water vapour transmission rate of rigid materials*

ISO 2896:1987 *Cellular plastics-Determination of water absorption*

ISO 4897:1985 *Cellular plastics-Determination of the coefficient of linear thermal expansion of rigid materials at ambient temperatures*

ISO 8302:1991 *Thermal insulation- Determination of steady-state thermal resistance and related properties-Guarded hot plate apparatus*

ASTM C518:1991- *Standard Test Method for steady-state heat flux measurements and thermal transmission properties by means of heat flow meter apparatus*

General description

IsoBoard® Nail Up Insulated Ceilings are extruded polystyrene rigid foam boards made in 25, 30 and 40 mm thicknesses to suit the required levels of thermal performance. Ceiling boards are 600 mm wide with the longitudinal edges tongued-and-grooved and bevelled. Boards may also be supplied with longitudinal grooves cut in their surface at 100 mm centres (IsoPine boards). Boards are supplied in standard lengths of up to 8 m. The ends of the boards are square-cut

The physical properties of IsoBoard® Nail Up Insulated Ceilings are set out in Table 3.

Table 3

Property	Standard	Value
Density	ISO 845: 1988	32 - 36 $^{kg}/_{m^3}$
Compressive strength	ISO 844: 1978	0,250 - 0,310 MPa (for 50 mm thick board)
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	67 x 10^{-6} per °C
Thermal conductivity (average of two tests)	ISO 8302: 1991 (E) or ASTM C518	0,024 $^{W}/_{mK}$ *
* A thermal conductivity design value of 0,030 $^{W}/_{mK}$ is recommended which allows for long-term aging (See Table 2)		

Manufacture

IsoBoard® Nail Up Insulated Ceiling boards are manufactured by Isofoam (South Africa) (Pty) Ltd in its factory in Atlantis Industria. Isofoam SA (Pty) Ltd distributes the product throughout South Africa.

Delivery and site storage

The boards are supplied in packs wrapped in white-coloured, translucent plastic sheets which carry the identification symbol of Agrément South Africa and with handling instructions.

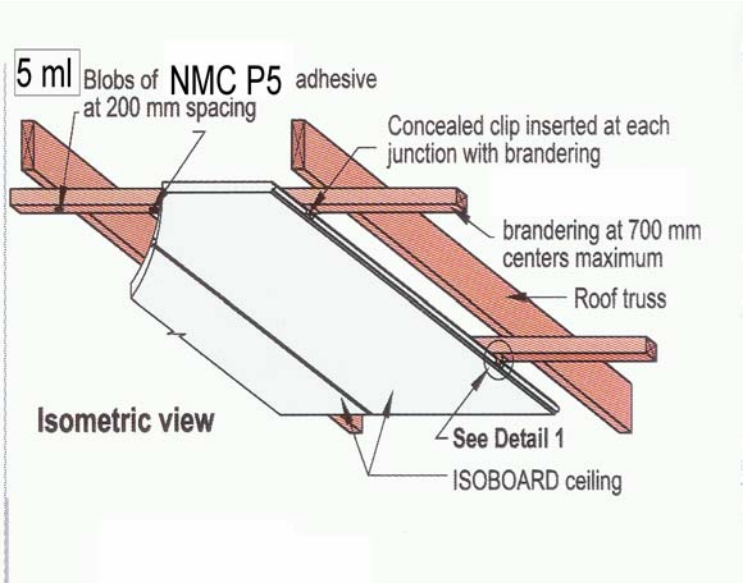
IsoBoard® Nail Up Insulated Ceilings must be stored flat in covered areas away from exposure to weather, direct sunlight and ultra-violet light. Care must be taken to prevent boards coming into contact with solvents and materials containing volatile organic components which may have adverse effects on the polystyrene.

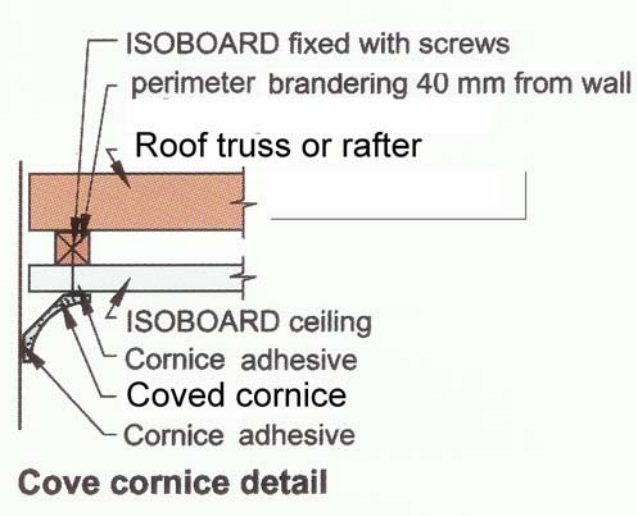
Boards must not be exposed to naked flame or other heat sources. They should not be stored near materials such as packaging paper, waste and flammable liquids.

Care is required during handling to prevent damage to boards by wind and impact damage to the face and edges of the boards.

Installation

Timber brandering or cold formed galvanized steel sections, as ceiling supports, are installed transversely to the underside of roof trusses or roof rafters at a maximum of 700 mm centres. Ceiling supports are sized to suit roof truss or rafter spacings. Similar members are fitted at the same height, either to the underside of rafters or trusses or to walls around the perimeter of the area in which the ceiling is to be installed.



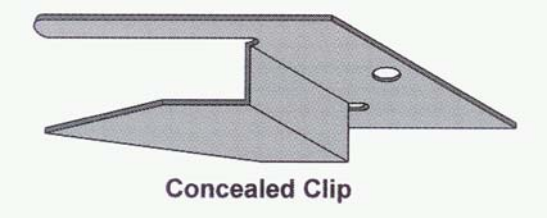


Cove cornice detail

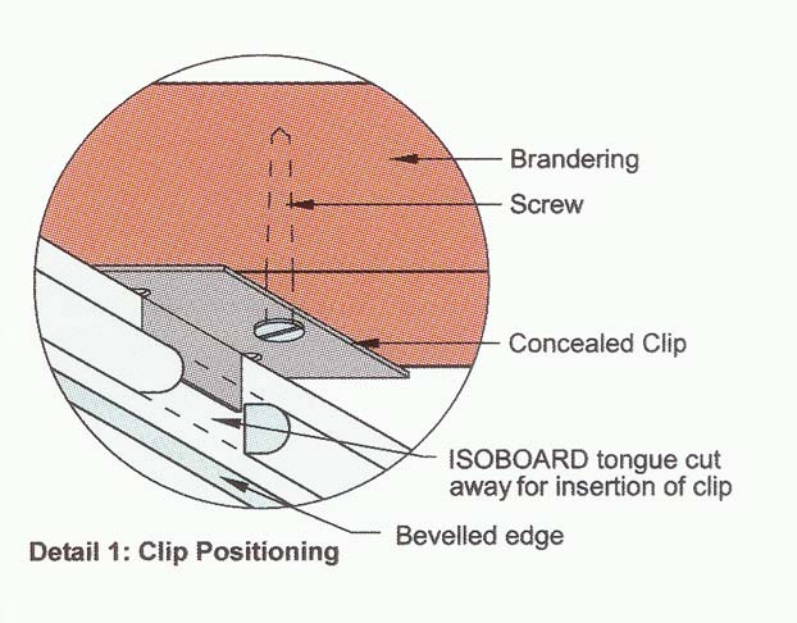
IsoBoard® Nail Up Insulated Ceiling boards are ordered in lengths so as to ensure that butt joints do not occur along the length of ceiling boards. Boards are trimmed to length on site to ensure that once installed a 5 mm gap occurs between the edge or end of the board and the wall.

IsoBoard® Nail Up Insulated Ceiling boards are fixed to ceiling supports using mechanical fixings and NMC P5 adhesive applied in 5 ml 'blobs' at 200 mm centres along the underside of the ceiling supports. Surfaces onto which adhesive applied must be free of dust and dirt (should oil be present on the cold formed steel sections this is to be removed with a suitable agent in accordance with the manufacturer's recommendations). Mechanical fixings take the form of:

- screws and washers at 300 mm centres along and into the perimeter support. The heads of the screws are prevented from pulling through the board by the washers. Screws are positioned so as to be concealed by the cornice once installed
- concealed clips installed at the edges of boards at ceiling supports. The tongue or top of groove at the edge of the board is broken out so as to allow full penetration of the spike of the clip into the side of the board. This ensures that the clip does not interfere with the positioning of subsequent boards at the tongue-and-grooved interface. Clips are fixed to ceiling supports by means of wood screws in the case of timber brandering or by steel self tapping screws or pop rivets in the case of cold formed steel sections.

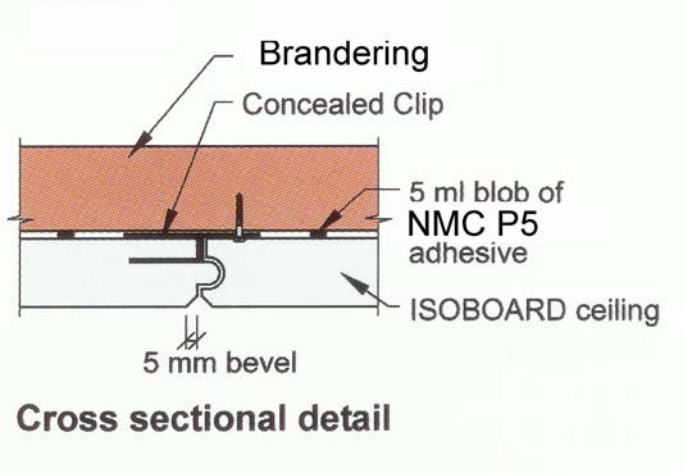


Concealed Clip



Detail 1: Clip Positioning

Once the ceiling boards and mechanical fixings have been installed, the boards are pressed against the ceiling supports to ensure thorough contact between the various interfaces.



Cross sectional detail

For a flush ceiling effect a flat board is used and after installation the groove formed by the bevelled edge of the board is filled with adhesive, sponged flat and clean and allowed to dry. Thereafter, a PVA/cellulose filler mixture is applied over the joint using a 100 mm wide spatula. Once dry, the length of the joint is sanded smooth with a fine emery paper.

Once the IsoBoard® Nail Up Ceiling is in place cornices, which may be timber, plaster or polystyrene are installed.

It is recommended that domestic ceilings always be painted. Commercial and Industrial ceilings are painted where specified. Where painting is required the surfaces of ceiling boards are wiped clean and finished in two coats good quality matt acrylic paint.

Light fittings

Light fittings must not be hung from IsoBoard® alone but, depending on weight, must be supported on ceiling supports or from the roof structure itself.

Energy Saver lamps and fittings which do not generate temperatures more than 70 °C may be used in close proximity to IsoBoard®.

Flourescent lamp holders (with fitted ballast) must be spaced at least 3 mm from IsoBoard® using washers.

Downlighters are to be of the tilt or swivel variety and are to be fitted with aluminium shields which reflect both light and heat (Alu shield lamps MR16 (12V) or GU10(220V). Downlighters can be readily housed in holes cut in the IsoBoard®. A 150 mm airspace must be provided above ceilings to facilitate ventilation.

Transformers for 12V installations must be supported on ceiling supports or the roof structure at least 200 mm away from lamp fittings.

Maintenance

Maintenance in the form of re-decoration is carried out as for conventional plasterboard ceilings with small damaged areas of board filled with cellulose filler prior to painting. A matt acrylic paint is recommended. Solvent based paints must not be used.