Agrément Certificate 2006/323
(Amendment October 2018)

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

PO Box 72381 Lynnwood Ridge 0040

Telephone 012 841 3708

Fax 012 841 2539

E-mail info@agrement.co.za

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

Subject:
Isoboard® Nail Up Insulated Ceilings

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

PO Box 1584 DASSENBERG 7350

Isoboard® website: www.isoboard.co.za

Enquiries related to this document to be addressed to agrementenquiries@isoboard.com

ISOBOARD® Fit for Purpose Thermal Insulation ZERO ODP

Use

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

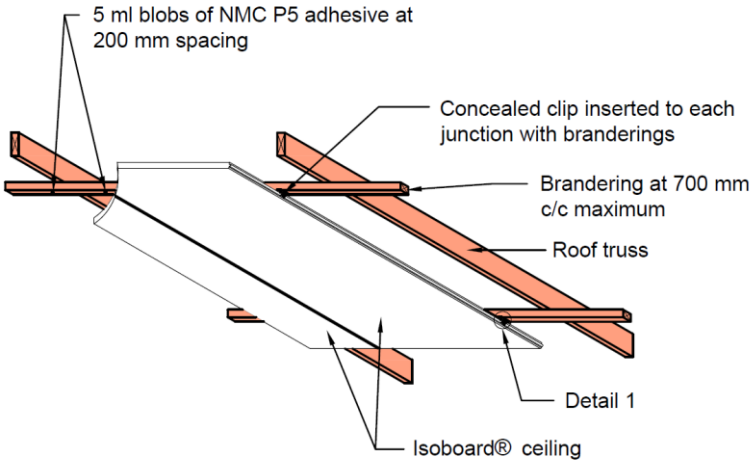
This certificate and Agrément South Africa's assessment apply only to Isoboard® Nail Up Insulated Ceilings that are manufactured and installed as described and illustrated in this certificate, and where the terms and conditions of certification are complied with.

The certificate specifically excludes the use of Isoboard® Nail Up Insulated Ceilings when used in conjunction with another 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, purlins or cold formed galvanised steel sections, or roof rafters by means of concealed fixing clips and adhesive. Isoboard® Nail Up Insulated Ceiling boards are:

- white in colour
- 600 mm wide with the longitudinal edges of the boards bevelled and tongued-and-grooved. Boards may also be manufactured with longitudinal grooves cut in their surface giving the appearance, once installed, similar to that of tongue and groove timber ceilings. The ends of the boards are square cut.
- manufactured in standard thicknesses of 25 mm, 30 mm up to 80 mm in increments of 10 mm, with board thicknesses above 50 mm made(are manufactured as per request) to order
- supplied in standard lengths of up to 8,0m.



Isometric view

CONTENTS

PREAMBLE

This reviewed certificate is issued by Agrément South Africa in terms of the Agrément South Africa's Act no. 11 of 2015.

The amendments in the above mentioned certificates are highlighted in red in the certificates and pertain mainly to

- a change in blowing agents used in the manufacturing process of the extruded polystyrene
- references to building regulations,
- the accommodation of Building Regulation XA
- editorials have been made to clarify the uses of the products

The original certificate with this subsequent amendment:

- 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 building owner or his or her agent 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 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 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.

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 adheres to the requirements of this certificate and in accordance with an approved quality system.

Republic of South Africa. *National Building Regulations*, Government Notice No R. 711, Government Gazette No 34586, Pretoria, South Africa, 9 September 2012.

SANS 17050-1: *Conformity assessment – Supplier's declaration of conformity Part 1: General requirements*

SANS 17050-2: *Conformity assessment – Supplier's declaration of conformity Part 2: Supporting documentation*

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
(Amended October 2018)

AGRÉMENT SOUTH AFRICA
innovative construction product assessments

PART 1: CONDITIONS OF CERTIFICATION

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

- are manufactured and supplied by
  - the certificate holder or
  - a licensee appointed and registered as such with Agrément South Africa.
- are installed in accordance with Part 3 and the certificate holder's Installation Manual.
- comply 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 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 the National Building Regulations.

Isofoam (South Africa) (Pty) Ltd shall be responsible for the accuracy of the information contained within the Material Data Sheets, Technical Data Sheets and Material Performance Specifications, and all other information pertaining to the supply and installation of Isoboard Nail Up Ceilings. Isofoam (South Africa) (Pty) Ltd shall submit a COA (Certificate of Analysis) and COC (Certificate of Compliance) in terms of the requirements stipulated in **SANS 17050-1** Suppliers declaration of conformity when requested by Agrément South Africa in accordance with the documentation requirements of **SANS 17050-2**. Should Isofoam (South Africa) (Pty) Ltd change or substitute any ingredient in the formulation of the product in question, then a notification shall be addressed to Agrément South Africa immediately.

General conditions

Marking

Where possible, the product packaging must be suitably marked with Agrément South Africa's identification logo.

Validity

The continued validity of this certificate is subject to a satisfactory review by Agrément South Africa every three years.

Quality monitoring

The certificate holder is required to participate in Agrément South Africa's post-certification quality management system which requires:

- that the certificate holder shall continue to implement and manage the quality system approved by Agrément South Africa in the assessment of Isoboard® Nail Up Insulated Ceilings
- the certificate holder to notify Agrément South Africa within 30 days of any change of address of a factory and any new factories brought into operation by the certificate holder, for the purpose of manufacturing the subject of the certificate
- the certificate holder at any time of commencement of each contract, to provide Agrément South Africa with construction sites or structures on which the subject is to be used, and
- the co-operation of the certificate holder in facilitating post-certification quality monitoring by Agrément South Africa or its authorised agents.

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.

Chairperson

18 October 2018

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 Isoboard® Nail Up Insulated Ceilings as 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 are:

- the use of extruded polystyrene rigid foam board as thermally insulating ceilings
- the method of fixing ceiling boards to the underside of timber ceiling brandering, purlins or cold formed galvanised steel sections or roof rafters with concealed mechanical fixings and the use of adhesives.

This assessment is based on:

- documentation provided by the client
- inspection of the applicant's factory and completed installations
- tests carried out on the product
- 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 the uses specified (see page1).

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

- Agrément South Africa's performance criteria and requirements for durability
- 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

Aspects of performance	Opinion of Agrément South Africa	Compliance with the National Building Regulations
Materials	Satisfactory. The physical properties of Isoboard® Nail Up Insulated Ceilings have been determined in accordance with international standards.	The materials used in the Isoboard® Nail Up Insulated Ceilings are deemed to satisfy the requirements of regulation A13 (1) (a) *Administration*.
Behavior in relation to fire	Satisfactory. Although Isoboard® is considered to be combustible in terms of SANS 10177: Part V, it may be used buildings up to two stories in height in horizontal and vertical applications, except for the provisos listed in **SANS 10400** Part T, Clauses 4.13 *Ceilings* and 4.15 *Internal finishes*. 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 **SANS 10177**: *Fire testing of materials, components and elements used in buildings* **SANS 428**: *Fire performance classification of thermal insulated building envelope systems*	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). When tested in accordance with the **SANS 428** Isoboard® (25 to 80 mm thick) is classified having the following attributes: • Combustibility: (B) • Does not support flame spread: (B1) • Use identification for single and double storey buildings: (2) • May be used for both horizontal and vertical applications: H & V • May be used with or without sprinkler systems: (SP and USP) Product identification in terms of **SANS 428**: B/B1/2/ H & V (SP and USP)

Table 1: Compliance with the National Building Regulations (Continued)

Aspects of performance	Opinion of Agrément South Africa	Compliance with the National Building Regulations
Energy usage in buildings	Satisfactory.	For standard metal sheeting and clay tile roof assemblies for use in occupancies or building classifications falling within the scope of Regulation XA: *Energy usage in buildings,* when using the deemed to satisfy prescriptive requirements of Regulation XA3 a), the required added R-Value to be provided in roofs by added insulation is indicated in **Table 8** – *Metal sheeting roofs assemblies* and **Table 9** – *Clay tile roof assemblies* of **SANS 10400-XA.** This additional, R-Value may be made achieved by means of a single layer of insulation or by a combination of compatible insulation systems. However, these required additional R-Values may be reduced when the Isoboard® Nail Up Ceilings are assessed for use in buildings in terms of a rational design by a competent person (the equivalent energy usage approach covered by Clauses 4.2.1 a) or c) of **SANS 10400-XA**).

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 conductivity value of 0,030 $Wm^{-1}K^{-1}$ be adopted for South African summer and winter conditions,	Isoboard® is effective as an insulation material. As with other foam or rigid foam insulation, thermal conductivity will increase over time as a result of: • migration of gases • absorption of water as a result of water vapour diffusion and exposure to free water however, extruded polystyrene (as used in the manufacture of Isoboard®) is known to be the rigid foam material least affected by these losses. Tests on Isoboard® in service in varied applications for up to 20 years confirm an average thermal conductivity of 0.028 W/mK.
Condensation	Satisfactory. Subject to roof ventilation being provided in dwellings in the Southern Coastal Condensation Problem Area as required in terms of the *Supplement to certificates.*	Condensation is unlikely to occur on the underside of ceilings. However, warm humid air may permeate joints in and around ceilings and condense on the underside of cold metal sheet or other roof coverings. This condensate may drip onto ceilings and penetrate ceilings at joints resulting in staining and water damage. The penetration of warm humid air through Isoboard® ceilings at joints and subsequent problems with condensation may be greatly reduced if not eliminated by sealing the joints between boards. This sealing may be achieved by applying a continuous bead of silicone sealant in the grooved edge of the board during the installation process. Silicone which squeezes out of the joint on the underside of the board may be readily removed using a cloth.
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 buildings indicate that the specified maximum spans and the specified method of fixing is sufficient to resist self weight and likely wind suction. However, when used in external applications or high wind areas, the number of fixing points should be doubled or the brandering or other support spacings halved.

Durability	Satisfactory. Subject to proper installation, normal use, adequate and regular maintenance, Isoboard can be expected to last the life of the building	Isoboard® is rot-proof, offers no food value to vermin and will not support mould or fungal growth. Isoboard® is affected by ultra-violet light when boards are not finished in water based paints. Isoboard® is also affected by exposure to temperatures over 70.˚C, as would occur when in contact with some light fittings. Boards will also be damaged by exposure to solvents and materials containing volatile organic components. Where accessible Isoboard® Nail Up Insulated Ceilings are vulnerable to impact damage and vandalism. However, damaged boards may be readily replaced or local damage repaired using Permabond and cellulose filler.

Table 3: Quality Management System

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 will ensure that quality of manufacture will be consistently maintained.	Agrément South Africa's requirements are based on **SANS/ISO 9001:** **SANS/ISO 9001:** Quality Management Systems- Requirements'

PART 3: TECHNICAL DESCRIPTION

General description

Isoboard® Nail Up Insulated Ceilings are extruded rigid closed cell polystyrene boards manufactured in various thicknesses and lengths. Boards are manufactured with tongue and groove longitudinal edges.

The visible longitudinal edges of ceiling boards are bevelled, and the visible face of the board may be finished in an Isopine surface finish. Boards with the Isopine finish have grooves at 100 mm centres down the length of the board giving the board a tongue and groove pine ceiling board appearance.

Isoboard® Nail Up Insulated Ceilings may be installed horizontally or may follow the slope of the roof. Boards may be fixed:

- to the underside of ceiling brandering attached in turn to the underside of rafters or roof truss bottom chords,
- between rafters or truss chords, fixed to the underside of battens or purlins attached in turn to the tops of the rafters or truss chords, or
- to the underside of rafters, providing recommended spacing limitations to prevent deflection are not exceeded.

Boards along the perimeter of ceilings are fixed to brandering attached to walls. The joint between walls, rafters or truss chords may be concealed with Isoboard Extruded Cornices or timber cornices which may be glued in to walls using compatible adhesives.

Isoboard® Nail Up Insulated Ceiling boards are manufactured by Isofoam (South Africa) (Pty) Ltd in its factory in Atlantis Industria from where it is distributed to branches of Isofoam SA (Pty) Ltd and various outlets throughout the country. Isofoam SA (Pty) Ltd offers technical support throughout the country upon request.

Manufacture

Isoboard® Nail Up Insulated Ceilings are rigid closed cell foam boards manufactured from extruded polystyrene. Boards have a density typically of between 32 and 36 kg/m^3. The blowing agent used in the manufacturing process is a mixture of R134a and R152a HFC's (hydrofluorocarbons) with zero ozone depletion properties.

Boards are extruded in standard thicknesses of 25 mm, 30 mm up to 80 mm in increments of 10 mm, with boards 50 mm and above made to order. 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.

ISO 845:2006(en) *Cellular plastics and rubbers- Determination of apparent density.*

ISO 844: 2006(en) *Rigid cellular plastics- Determination of compression properties.*

ISO 1663:2007(en) *Rigid cellular plastics- Determination of water vapour transmission properties*

ISO 2896:2001(en) *Rigid cellular plastics- Determination of water absorption*

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

ISO 2796:2011(en) *Cellular plastics, rigid – Test for dimensional stability under specified temperature and humidity conditions*

ISO 8301:1991(en) *Thermal insulation- Determination of steady-state thermal resistance and related properties*

Physical properties

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

Table 3

Property	Standard[4]	Value
Density (on sample 40 mm thick)	ISO 845: 2006 (en)	43,1 $^{kg}/_{m^3}$
Compressive strength (on samples 30 and 40 mm thick)	ISO 844: 2006(en)	310 kPa
Water vapour permeability (on samples 30, 40 and 50 mm thick)	ISO 1663: 2007(en)	0,75 $^{ng}/_{(Pa.s.m)}$
Water absorption (on samples 30, 40 and 50 mm thick)	ISO 2896: 2001(en)	0,87 % by volume
Coefficient of linear thermal expansion (on samples 30, 40 and 50 mm thick)	ISO 4897: 1985(en)	0,040 mm/m.°C
Dimensional stability (on samples 30, 40 and 50 mm thick)	ISO 2796:2011(en)	Less than 0,86 % in all three directions (x,y and z axis)
Thermal conductivity (on sample 40 mm thick)	ISO 8301: 1991(en)	0,028 $^{W}/_{mK}$
* A thermal conductivity design value 0,030 $^{W}/_{mK}$ is recommended which allows for long-term ageing (See Table 2)		

Delivery and site storage

The boards are delivered to site in packs wrapped in light-coloured, translucent plastic sheets.

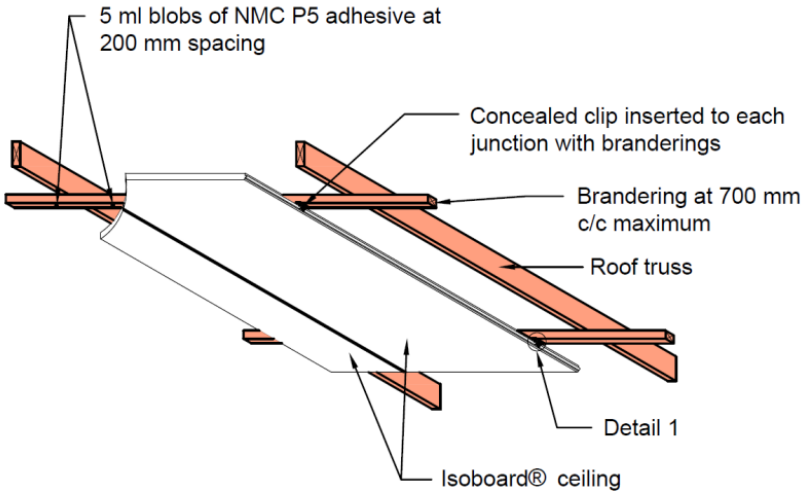
Isoboard® Nail Up Insulated Ceilings must be stored flat in covered areas away from exposure to weather and direct sunlight. Care must be taken to prevent boards coming into contact with solvents and materials containing volatile organic components which will have adverse effects on the polystyrene.

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.

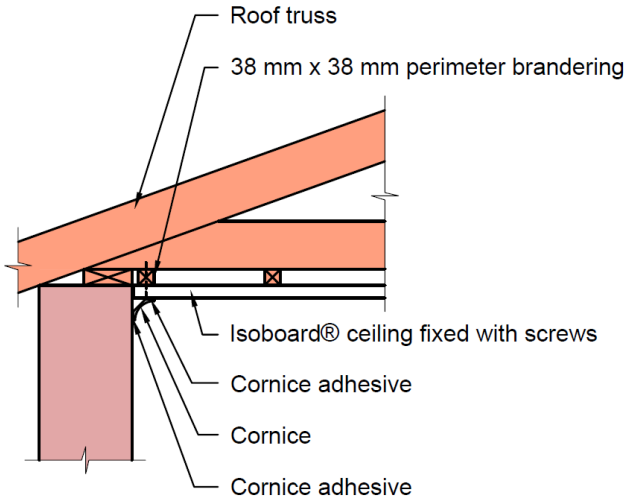
Care is required during handling to prevent damage to the face and edges of the boards.

Installation

Where Isoboard® is not fixed directly to the underside of rafters, it is fixed to timber brandering, purlins or cold formed galvanised steel sections installed transversely to roof trusses or roof rafters at a maximum of 750 mm centres. Supporting members are sized to suit roof truss or rafter spacings. Similar members are fitted, where necessary at the same height, to walls around the perimeter of the area in which the ceiling is to be installed. It is important that the board be installed positively fixed on both ends to prevent movement.



Isometric view



Cove cornice detail

Boards may be cut to length or trimmed on site using a sharp knife or hack-saw. The ends and edges of boards are trimmed on site to ensure that once installed a 5 mm gap occurs between the edge or end of boards and perimeter walls.

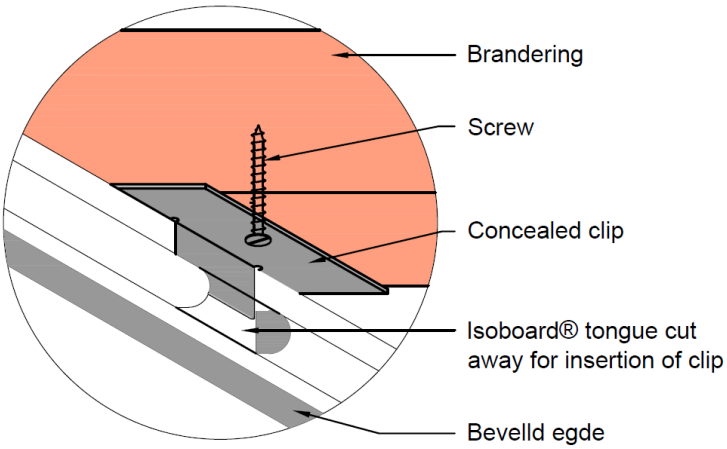
Typical ceiling installations are usually indoors and therefore shielded from gusts of wind and associated high wind pressures. Typical indoor fixing details are as indicated below. However, where ceilings may be exposed to gusts of wind, for example, when installed under eaves or in roofs of open patios etc, the fixings indicated below must be doubled.

For typical installations, five millilitre (5 ml) 'blobs' of Isoglue adhesive are applied at 200 mm centres along the underside of the ceilings supports (should forming lubricants be present on the cold formed steel sections this is to be removed with a suitable de-greasing agent in accordance with the manufacturer's recommendations). Boards are then placed in position and secured with the aid of mechanical fixings, ensuring contact between IsoBoard, adhesive and brandering. These mechanical fixings take the form of:

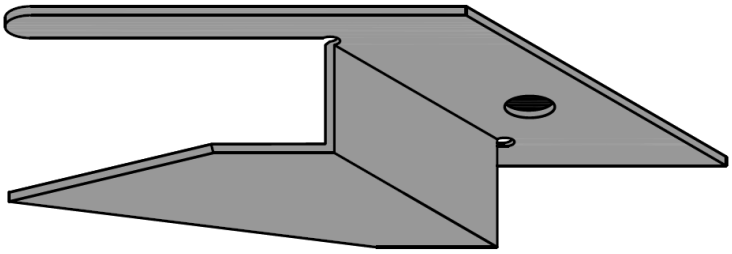
- drywall screws and washers at 300 mm centres along and into the perimeter support. The heads of the screws are prevented from pulling through the board by the washers. Screws are positioned so as to be concealed by the cornice once installed
- concealed clips installed into the edges of boards at ceiling support intersections. The spike of the clip is pressed firmly into the grooved edge of the board so as to ensure that the vertical portion of the clip is flush with the surface of the board This ensures that the clip does not interfere with the positioning of subsequent boards at the tongue and groove interface which may otherwise result in a small but visible gap between boards. The clips ensure the IsoBoard is tightly held in contact with the adhesive and ceiling supports while the adhesive cures. 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.

Isoboard supply adhesive and concealed ceiling clips on request when the board is used for this application.

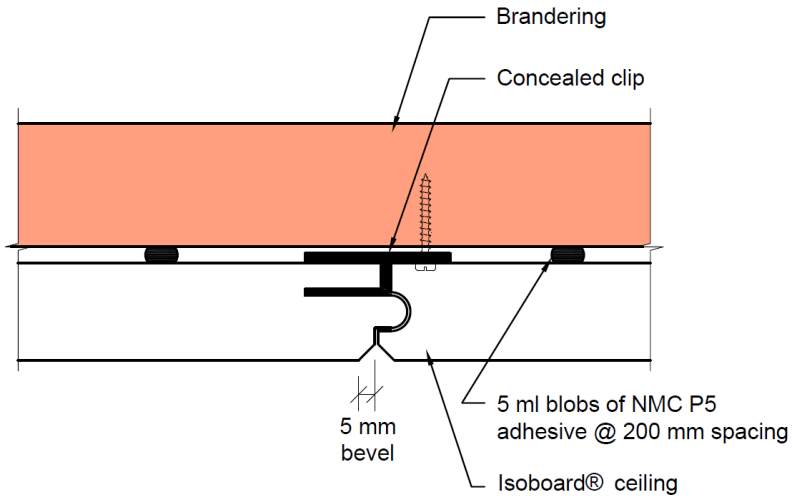


Detail 1: Clip positioning



Concealed clip

Once mechanical fixings have been installed the ceiling board is pressed against the ceiling supports to ensure thorough contact with the adhesive.



Cross sectional detail

Once the Isoboard® Nail Up Ceiling is in place extruded polystyrene or timber cornices may be installed.

Surface indentations and imperfections may be repaired using Plascon Polyfilla mixed with Alcolin Permabond diluted 1:3 in accordance with Alcolin's recommendations.

After installation and prior to painting, boards should be cleaned and static charges which may be present on the Isoboard removed, if necessary, using a cloth and softened water solution. When a painted finish is required, boards should be finished in two coats of good quality water based paint or wood stain.

Light fittings

No light fitting, lamp or electrical lighting component that exceeds 70 °C should be in direct contact with IsoBoard. Isoboard® so exposed may soften and retract from the heat source causing damage to the board. LED lamps are recommended for down lighters.

Maintenance

Maintenance in the form of re-decoration is carried in a similar fashion to that required on conventional plasterboard ceilings.

Where boards have been damaged, they may be readily replaced or local indentations filled with Plascon Polyfilla mixed with Alcolin Permabond diluted 1:3 in accordance with Alcolin's recommendations.

When painting Isoboard®, a matt acrylic is recommended. Solvent based paints must not be used.