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Validity

Users of any Agrément certificate should check its status: all currently valid certificates are listed on the web site. 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.

SANS 10400 – 1990 The application of the National Building Regulations

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PO Box 395 Pretoria 0001
Telephone +27 12 841 3708
Fax +27 12 841 2539
Email agrement@csir.co.za
www.agrement.co.za

Subject:

IsoBoard® Over Rafter and Truss Insulation

Certificate holder:

Isofoam (South Africa) (Pty) Ltd

PO Box 3804 TYGER VALLEY 7536

Telephone: 021 930-5074 Fax: 021 930-5075

Email: southsales@isoboard.com

Web site: www.isoboard.co.za



Use

The certificate covers the manufacture and installation of IsoBoard® Over Rafter and Truss Insulation in new or renovated buildings of all occupancy classes (**SANS 10400**: Table 1 of regulation A (20) (1)) in all areas of South Africa.

This certificate and Agrément South Africa's assessment apply only to IsoBoard® Over Rafter and Truss Insulation that is 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® Over Rafter and Truss Insulation when:

- used in conjunction with any other facing material, whether combustible or non-combustible
- battens or purlins are fixed to rafters or trusses using nails
- when insulation thickness exceeds 40 mm.

Such circumstances are outside the scope of the assessment and as such must be the subject of further testing.

General Description

IsoBoard® Over Rafter and Truss Insulation is extruded polystyrene rigid foam board that is installed between rafters or roof trusses and tile battens or sheeting purlins to form insulated ceilings. The 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 lengths of 4.8, 6 and 8 m and halves thereof. (Regional Distribution stores may carry additional standard lengths).

Isoboard® is supplied in packs wrapped in white, translucent plastic sheets.

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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® Over Rafter and Truss 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® Over Rafter and Truss 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 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 that 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® Over Rafter and Truss Insulation in accordance with this certificate and authorised by Isofoam (South Africa) (Pty) Ltd 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.

Good building practice as discussed in:

- The supplement to certificates by Agrément South Africa
- The *Home building manual parts 1, 2 & 3* issued by the National Home Builders Registration Council (NHBRC)

Isoboard® Over Rafter and Truss Insulation

Tested and approved fit for purpose for use as Over Rafter and Truss Insulation when used as specified in

CERTIFICATE
2010/382

 **AGRÉMENT**
SOUTH AFRICA
innovative construction product assessments

The IsoBoard® Over Rafter or Truss Insulation as described in this certificate must be:

- manufactured and supplied by
 - the certificate holder or
 - a licensee appointed and registered as such with Agrément South Africa.
- installed or used in accordance with
 - the technical description set out in [Part 3](#)
 - the certificate holder's Installation Manual or specification
 - good building practice
- 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.

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.

Quality monitoring

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

- that the certificate holder shall continue to implement and manage the quality system approved by Agrément South Africa in the assessment of the Isoboard® Over Rafter and Truss Insulation
- the cooperation 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.

Joseph Odhiambo

Chairperson

November 2010

PART 2: ASSESSMENT

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

Scope of assessment

This assessment applies to those innovative aspects of IsoBoard® Over Rafter and Truss Insulation as described in [Part 3](#) of the certificate. It also applies to those conventional aspects of roofs 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 a thermally-insulating ceiling material
- the placing of the extruded polystyrene rigid foam board between the tops of rafters or trusses and tile battens or sheeting purlins.

This assessment is based on:

- documentation provided by the client
- inspection of the applicant's factory and completed installations
- tests carried out on the IsoBoard® when used in the over rafter or truss application
- the certificate holder's quality management system

Assessment

In the opinion of Agrément South Africa, IsoBoard® Over Rafter and Truss Insulation, as described in the certificate, is suitable for use in new or renovated buildings of all occupancies.

The performance in use of IsoBoard® Over Rafter and Truss Insulation will be such that it will satisfy:

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

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

Compliance with National Building Regulations

Truss Insulation relates 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® have been determined in accordance with international standards.	IsoBoard® Over Rafter and Truss Insulation is deemed to satisfy the requirements of regulation A13 (1) (a): Administration.																																										
Behaviour in relation to fire	<p>Satisfactory.</p> <p>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), cognisance must be taken of SANS 10400 Part T clause TT13 <i>Ceilings</i>.</p> <div data-bbox="493 1137 812 1350" style="border: 1px solid green; padding: 5px; margin-top: 10px;"> <p>SANS 10177: <i>Fire testing of materials, components and elements used in buildings</i></p> </div>	<p>Comments made in <i>Supplement to certificates</i> 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).</p> <p>With regard to combustibility and fire properties, IsoBoard® has been classified as follows:</p> <table border="1" data-bbox="863 929 1442 1740" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: left;">Combustibility</th> </tr> </thead> <tbody> <tr> <td style="width: 5%;">A</td> <td style="width: 85%;">Non-combustible</td> <td style="width: 10%;"></td> </tr> <tr> <td>B</td> <td>Combustible</td> <td style="text-align: center;">√</td> </tr> <tr> <th colspan="3" style="text-align: left;">Surface fire properties</th> </tr> <tr> <td>1</td> <td>No flame spread</td> <td style="text-align: center;">√</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> <th colspan="3" style="text-align: left;">Material application</th> </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 and vertical</td> <td style="text-align: center;">√</td> </tr> </tbody> </table>	Combustibility			A	Non-combustible		B	Combustible	√	Surface fire properties			1	No flame spread	√	2	Low flame spread (no flaming droplets or burning brand)		3	Low flame spread (with flaming droplets or burning brand)		4	Average flame spread (no flaming droplets or burning brand)		5	Average flame spread (with flaming droplets or burning brand)		6	Rapid fire spread		Material application			H	Horizontal		V	Vertical		H&V	Horizontal and vertical	√
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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 $0.030 \text{ Wm}^{-1}\text{K}^{-1}$ 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: <ul style="list-style-type: none"> • migration of gases • absorption of water as a result of water vapour diffusion and exposure to free water. <p>A theoretical assessment using Agrément South Africa’s computer simulation indicates that by replacing the standard uninsulated 6.4 mm gypsum plasterboard horizontal ceiling in the Agrément Standard House of 53 m² with 25 mm thick IsoBoard® Over Rafter and Truss Insulation (and thus increasing the volume of the dwelling by approximately 20%):</p> <ul style="list-style-type: none"> • the maximum summer temperatures will drop by approximately 1°C • winter heating energy requirements will be reduced between 20 and 30%.
Condensation	Satisfactory.	Condensation is unlikely to occur on the underside of IsoBoard® Over Rafter and Truss Insulation.
Ability of IsoBoard® Over Rafter and Truss Insulation to resist self weight and possible wind suctions	Satisfactory.	Short-term laboratory tests on IsoBoard® and inspections of completed installations indicate that the specified maximum spans together with the specified method of installation are sufficient to resist the effects of self weight and likely wind suction.
Durability	Satisfactory. Subject to normal use, a useful life equal to that of the building in which it is installed can reasonably be expected of IsoBoard® used in this application.	IsoBoard® is rot-proof, offers no food value to vermin and will not support mould or fungal growth. It can, however, be affected by ultra-violet light, excessive temperature build-up, solvents and materials containing volatile organic components. IsoBoard® Over Rafter and Truss Insulation is vulnerable to impact damage and vandalism.

Table 2: Assessment (continued)

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Structural stability of supporting beams and trusses	Satisfactory. Subject to the recommendations, and requirements given in the installation design notes of Part 3: <i>Technical description</i> of this certificate being adhered to.	The strength and stiffness of connections between battens or purlins and rafters or truss top chords will be reduced by the introduction of XPS or similar compressible material between connecting members. Cognisance must, therefore, be taken of a possible reduction in lateral stability to beams and truss members and the requirements of the installation design notes. It is also for this reason that nails are not considered an adequate method of fixing battens or purlins to rafters or trusses and the insulation thickness is limited to not more than that actually tested during the assessment.

Table 3: Quality management system

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Quality management system	The certificate holder’s quality management system complies with Agrément South Africa’s requirements. Properly applied, it will ensure that quality of manufacture will be maintained consistently.	Agrément South Africa’s requirements are based on SANS 9001 . <div style="border: 1px solid green; padding: 5px; display: inline-block;">SANS 9001: Quality management systems- Requirements</div>

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® Over Rafter and Truss Insulation is extruded polystyrene rigid foam board 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. The ends of the boards are square-cut. Boards are supplied in standard lengths of 4.8, 6 and 8 m, and halves thereof. Boards may also be supplied with longitudinal grooves cut in their surface at 100 mm centres (IsoPine boards).

The properties of IsoBoard® Over Rafter and Truss Insulation are set out in Table 4.

Table 4: Properties of Isoboard®

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® Over Rafter and Truss Insulation is 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 handling instructions.

IsoBoard® Over Rafter and Truss Insulation 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 that 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 (Figures 1 to 4):

Where necessary, bracing must be installed, as specified by the architect or engineer.

Double-sided adhesive tape is applied to tops of rafters or truss top chords to prevent boards from moving during the installation process.

IsoBoard® is laid across rafters or trusses ensuring that butt joints, where necessary, occur over rafters/trusses.

Battens/purlins are placed in position on the IsoBoard® and holes at fixing positions pre-drilled through battens/purlins through the IsoBoard® and into rafters/trusses to ensure that screws are properly centred. Battens/purlins are secured using Timberfix or similar screws. Nails are not to be used to fix battens or purlins to rafters or trusses. Where purlins are being installed to support roof sheeting, counter battens are fixed along rafter centrelines, on top of the IsoBoard® to ensure that boards are not displaced or damaged by wind uplift. Alternatively, boards may be secured to rafters using screws and washers. Care must be taken to ensure that screws are not over tightened.

A quarter-round or similar timber edging may be secured to rafters/truss top chords beneath the IsoBoard to finish the installation. The exposed surface of the IsoBoard® is given two coats of good quality Acrylic or PVA paint. IsoBoard® may be painted prior to installation.

In the case of steel roof sheeting and where specified, fibrous sound insulation is installed between the IsoBoard® and the sheeting.

Where concrete tiles are to be used as a roof covering, undertile membranes must be installed in the normal manner.

Over Rafter Insulation design notes (Figures 1 and 2):

For the purposes of these notes, a rafter is defined as a simply supported timber beam with its ends prevented from lateral movement and torsional rotation about its longitudinal axis.

- Screw connections fixing battens/purlins to rafters through IsoBoard® panels in combination with standard lateral bracing can be considered to provide sufficient lateral restraint to the timber rafters under gravity load, subject to the following limitations:
 - maximum rafter span of 6 m
 - maximum spacing between braced battens/purlins of 600 mm
 - maximum rafter size of 75 mm x 225 mm
 - maximum imposed live load on roof of 0.5 kPa

Applications with dimensions exceeding those given above have not been assessed at this time. However, these limitations can be exceeded if other bracing elements are introduced to provide lateral restraint to the tops of rafters.

- Battens/purlins must be fixed through the IsoBoard using 150 mm long x 4.5 mm diameter Timberflex or equivalent screws. Screws must be inserted in pre-drilled holes to ensure that screws are centered on batten/purlin and rafters members.
- Battens/purlins and rafters are to be spaced, depending on the roof covering type, as well as the dimensions of the batten/purlin in accordance with the limitations in Tables 5 and 6.
- Battens/purlins and rafters are to be SA Pine Grade 4 or better.



Figure 1: Isoboard® over rafter application with purlins laid directly over rafters

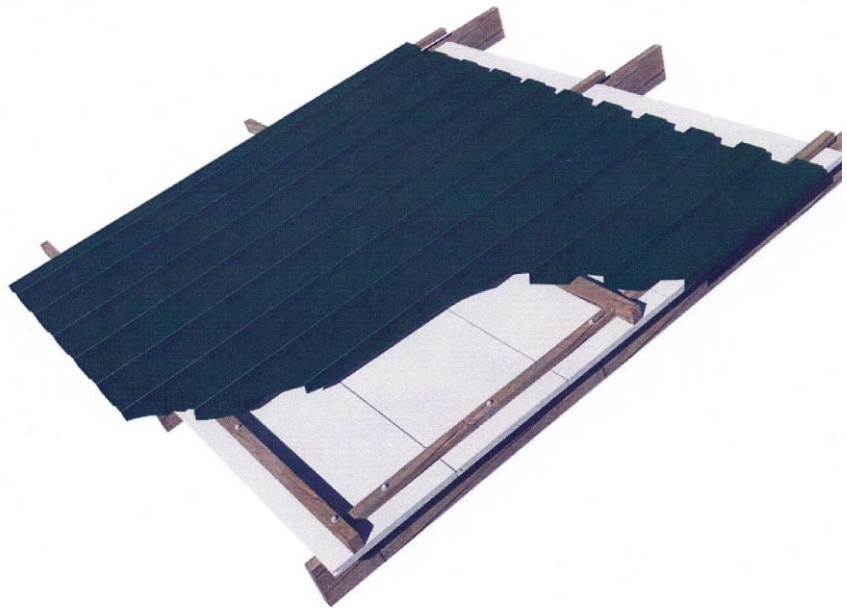


Figure 2: Isoboard® over rafter application with purlins laid perpendicular to rafters.

Note: counter battens laid over rafters between purlins.

Over Truss Insulation design notes (Figures 3 and 4):

For the purposes of these notes, a truss is defined as a built-up structural assembly consisting of top and bottom chords, as well as vertical and/or diagonal web elements.

- Top chords of trusses are to be braced below the IsoBoard® in the roof system in order to provide adequate lateral restraint. (Battens and purlins fixed above the IsoBoard do not provide adequate lateral restraint to the top chord of truss members)
- Battens/purlins are fixed to top chords through the IsoBoard® using 150 mm long x 4.5 mm diameter Timberflex or equivalent screws. Screws are to be installed in pre-drilled holes to ensure that screws are centered on batten/purlin and truss top chords.
- Battens/purlins and top chords of trusses are to be SA Pine Grade 4 or better.

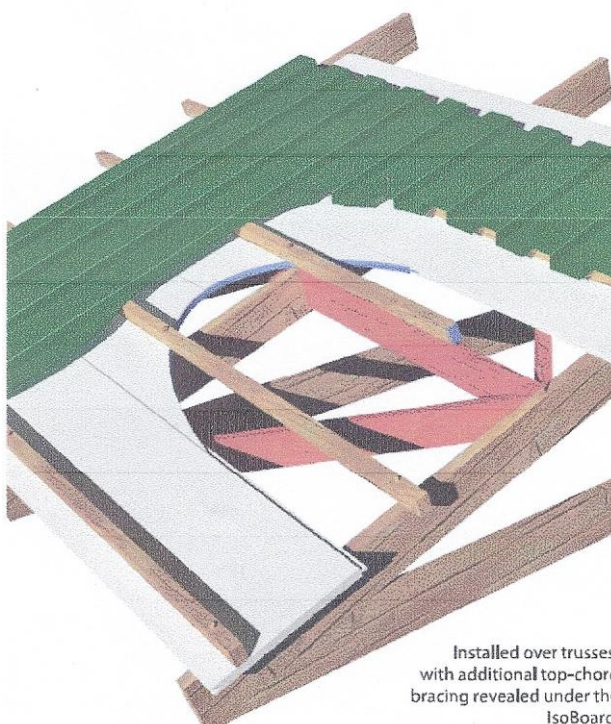


Figure 3: Isoboard® over truss application

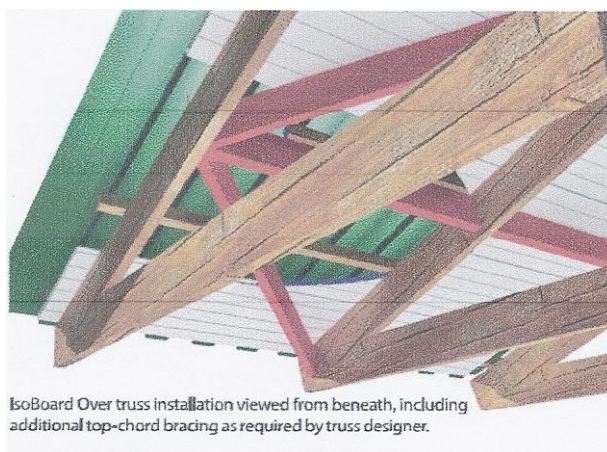


Figure 4: Isoboard® over truss application

Limitations applicable to batten/purlin and rafter/top chord (truss) centres:

The following limits are to be placed on batten/purlin and rafter/top chord centres to ensure that IsoBoard® bearing capacity is not exceeded:

Table 5: Spacing limits for battens and truss of tiled roofs		
Member sizes Battens on Truss (mm x mm)	Maximum allowed Supporting area (m ²)	Example of limits Battens x Truss (mm x mm)
38 x 50	0.195	310 x 629
38 x 75	0.257	310 x 945
50 x 50	0.293	350 x 735
50 x 75	0.385	350 x 1 100

Table 6: Spacing limits for purlins and truss of sheeted roofs		
Member sizes Battens on Truss (mm x mm)	Maximum allowed Supporting area (m ²)	Example of spacing limits Purlins x Truss (mm x mm)
38 x 50	0.323	600 x 535
38 x 75	0.484	600 x 806
50 x 50	0.425	600 x 705 705 x 600
50 x 75	0.635	1 000 x 635 800 x 790 1 050 x 600

Acoustic insulation

Where specified in roofs clad with steel sheeting, a layer of 75 mm thick fibre acoustic insulation may be laid over the IsoBoard® to dampen weather noise.

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 that do not generate temperatures of 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 that reflect both light and heat - Alu shield lamps MR16 (12V) or GU10(220V). Downlighters can be readily-housed in holes cut in the IsoBoard®.

Transformers for 12 V 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.