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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.

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Title:

ISOBOARD® OVER PURLIN ROOF INSULATION

Certificate holder:

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QUICK GUIDE

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This certificate covers the **manufacture and installation** of Isofoam® Over Purlin Insulation in all areas of South Africa as a thermal insulation layer in buildings, when installed between roof sheeting and purlins or between side cladding and girts (sheeting rails) in buildings that are designed, constructed and equipped in accordance with the National Building Regulations, **provided** it is manufactured and installed as described in [Part 3](#) and the conditions of certification given in [Part 1](#) of this certificate are applied.

The certificate holder is responsible for quality management during manufacture; the installer is responsible for quality management during installation. Isofoam (South Africa) (Pty) Ltd offers technical support from its offices in Cape Town, Pretoria, Johannesburg and Durban.

SUMMARY OF ASSESSMENT (see [PART 2](#))

Aspects of performance	Opinion of Agrément South Africa
Physical properties	The physical properties of Isoboard® Over Purlin Roof Insulation have been determined in accordance with the relevant ISO standards .
Thermal performance	Isoboard® is effective as insulation under roof sheets or side cladding. Its conductivity may increase with time. The recommended design value takes account of this.
Condensation and possible corrosion of metal roof sheet	Improved thermal performance will reduce condensation. However, interstitial condensation may occur between Isoboard® and roofs sheeting, and between sheeting overlaps in most areas of South Africa. Consequently, crevice corrosion may occur on uncoated galvanised steel sheets. The inner faces of such sheets should therefore be protected as recommended . Inspect sheet fixings periodically for signs of corrosion and replace where necessary.
Ability to span between purlins	The recommended maximum spans for the different thicknesses of Isoboard® Over Purlin Roof Insulation are acceptable.
Effect of roof sheet temperature	The performance of Isoboard® insulation is not unduly affected by hot roof sheets.
Properties in relation to fire	Isoboard® Over Purlin Roof Insulation will perform satisfactorily when stored and used as specified in this certificate.
Durability	When handled, stored, installed and cleaned as specified in this certificate, Isoboard® Over Purlin Roof Insulation will remain durable for the life of the building.
Quality management	The quality system adopted meets Agrément South Africa's requirements which are based on the SABS ISO 9000 Series and will ensure that quality in manufacture will be consistently maintained.

SABS ISO 9000 series
Quality management systems

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

No one may change any specification in the certificate; any new specification has to be approved in writing by the Board of Agrément South Africa before introducing the change.

Any change to the product could result in one or more aspects of performance no longer complying with Agrément criteria. Therefore any change would invalidate the certificate. In such circumstances the certificate cannot be used to show compliance with the National Building Regulations.

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PART 1: PREAMBLE AND CONDITIONS OF CERTIFICATION

PREAMBLE

This certificate is issued by Agrément South Africa in terms of the powers granted to it by the Minister of Public Works. It only covers Isofoam (South Africa) (Pty) Ltd's Isoboard® Over Purlin Roof Insulation when manufactured and installed as described in [Part 3](#) and that complies with the Conditions of Certification set out below. The certificate does not apply to any other product of Isofoam (South Africa) (Pty) Ltd.

The certificate has been granted after a technical appraisal of the performance of Isoboard® Over Purlin Roof Insulation. The certificate gives the [uses](#) (p 1) for which the product is considered satisfactory and precautions which must be taken in its use.

Agrément South Africa considers that the quality and performance of Isoboard® Over Purlin Roof 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. 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 the certificate issued by Agrément South Africa.

Responsibility for the proper exercise of the [quality management system](#) and the compliance of Isoboard® Over Purlin Roof Insulation with this certificate resides with the certificate holder.

This certificate is independent of any patent rights that may or may not subsist in the subject of the certificate.

Building authorities or users who are in any doubt about any detail or variation, should contact Agrément South Africa.

CONDITIONS OF CERTIFICATION

Adherence to specifications and conditions of certification

Isoboard® Over Purlin Roof Insulation has been evaluated by Agrément South Africa as a product in its entirety. The following aspects were evaluated by specialists in the specific fields:

- physical properties
- thermal performance
- condensation and possible corrosion of metal roof sheets
- ability of Isoboard® Over Purlin Roof Insulation to span between purlins
- effects of roof sheet temperatures on Isoboard® Over Purlin Roof Insulation
- properties in relation to fire
- durability of Isoboard® Over Purlin Roof Insulation
- an assessment of the certificate holder's quality management system.

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

Any change to the product could result in one or more aspects of performance no longer complying with Agrément criteria. Therefore any change would invalidate the certificate. In such circumstances the certificate cannot be used to show compliance with the National Building Regulations.

For these reasons:

- no one may change any detail specified in the certificate without the consent of Agrément South Africa
- any new detail has to be approved in writing by Agrément South Africa before it is implemented.

General conditions

This certificate covers only Isoboard® Over Purlin Roof Insulation as a thermal insulation layer in buildings, when installed between roof sheeting and purlins or between side cladding and girts (sheeting rails) in accordance with Part T, Fire Protection, of the National Building Regulations and when it is:

- manufactured by Isofoam (South Africa) (Pty) Limited, or by a licensee appointed by the certificate holder and registered as such with Agrément South Africa
- installed in accordance with this certificate and the certificate holder's Installation Manual, and within the framework of the limitations and conditions given in this certificate.

This certificate does not relieve the user of the subject from any obligation there may be to obtain the prior approval of the building authority concerned for the use of the subject.

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

The validity of this certificate is subject to the continued participation of the certificate holder in Agrément South Africa's post-certification quality assurance 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 to 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
22 June 2001

Licensee – Any person or company appointed by the certificate holder and registered with Agrément South Africa to manufacture insulation in accordance with the certificate and authorized by him to claim compliance with the certificate. The certificate holder is responsible to ensure that the licensee works in compliance with the certificate and the quality assurance scheme.

Tested and approved fit-for-purpose for use as over purlin roof insulation when used as specified in

CERTIFICATE 2001/287

**AGRÉMENT
SOUTH AFRICA**

innovative construction products assessments

PART 2: ASSESSMENT

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 the heat flow meter apparatus*

Thermal conductivity measured at 20 °C mean temperature and aged for 90 days. Thermal conductivity will increase with time when exposed to air and moisture. A recommended value to be assumed for design purposes is given under Thermal performance.

Conclusions

The results of the tests were satisfactory and in the opinion of Agrément South Africa Isoboard® Over Purlin Roof Insulation is satisfactory for the [use](#) specified (page 1).

Agrément South Africa's detailed comments on the various aspects of performance are set out below.

Physical Properties

The physical properties of Isoboard® Over Purlin Roof Insulation are tabulated below.

(Copies of test reports are available from [Isofoam \(South Africa\) \(Pty\) Ltd](#) on request)

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	67 x 10 ⁻⁶ per °C
Thermal conductivity	ISO 8302: 1991 (E) or ASTM C518	0,024 W/mK

Thermal performance

As is the case with similar materials, the thermal conductivity of Isoboard® Over Purlin Roof Insulation will increase with age. This increase in conductivity results from:

- migration of gases
- absorption of water as a result of:
 - exposure to free water
 - water vapour diffusion
 - freeze-thaw cycling.

Agrément South Africa recommends that for South African summer and winter conditions a thermal conductivity value of 0,030 Wm⁻¹K⁻¹ for Isoboard® Over Purlin Roof Insulation be adopted for design purposes. This value allows for a possible increase in conductivity due to ageing and water absorption.

Building regulations in South Africa do not currently specify minimum thermal requirements for various elements of buildings.

The position of Isoboard® Over Purlin Roof Insulation relative to the thermal mass distribution in a structure can have a significant effect on the thermal performance of the building and as such steady-state calculation methods are insufficient for predicting indoor conditions and energy consumption.

ASHRAE Handbook, Fundamentals Volume, American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc, Atlanta, GA 1989

The U values for various thicknesses of insulation applied over purlins and under metal and fibre-cement roof sheets are shown in the table below and may be used in transient calculation methods like the Transfer Function Method (TFM) developed by ASHRAE or other similar methods.

Table 1: U values of metal and fibre-cement sheeted roofs insulated with various thicknesses of Isoboard® Over Purlin Roof Insulation

Construction	U value of construction (Wm ⁻¹ K ⁻¹) with Isoboard® Over Purlin Roof Insulation (mm)				
	25	30	40	50	60
Metal sheeted roofs	1,03	0,88	0,69	0,55	0,48
Fibre-cement sheeted roofs	1,02	0,87	0,68	0,55	0,47

Note: The recommended thermal conductivity value of 0,030 Wm⁻¹K⁻¹ has been assumed.

Condensation and possible corrosion of metal roof sheets

Improved thermal performance will reduce the occurrence of condensation in susceptible buildings.

As is the case with other insulation, interstitial condensation can be expected to occur in Isoboard® Over Purlin installations in most areas of South Africa on the inner face of roof sheeting and side cladding and between sheet overlaps. Where activities within the building result in high levels of humidity, moist internal air will find its way through the insulation to the inner face of sheeting leading to more severe condensation.

As a result of interstitial condensation, serious crevice corrosion could occur on uncoated galvanised steel sheets. Such sheeting should therefore not be used in direct contact with Isoboard® Over Purlin Roof Insulation.

It is strongly recommended that the interior surface of galvanised steel sheets be coated with a 40 to 50 µm thick coating of good quality bituminous paint before the sheeting is installed. Sheets should be prepared and coated in accordance with the manufacturer's requirements. It is further recommended that periodic examination of selected roof fasteners be carried out to monitor whether corrosion is occurring.

Where a bituminous coating as described above (or an equivalent coating) is applied, Isoboard® Over Purlin Roof Insulation can be used in conjunction with galvanised steel sheeting in all areas where galvanised steel sheeting is presently in use.

Ability of Isoboard® Over Purlin Roof Insulation to span between purlins

Short term laboratory tests and inspections of completed buildings, some up to three years old, indicate that the specified maximum spans for the different board thicknesses are sufficient to resist selfweight and likely wind suction conditions.

Under no circumstance during installation, must any attempt be made to walk on the insulation boards between purlins.

Effects of roof sheet temperatures on Isoboard® Over Purlin Roof Insulation

Effects of slight settlements of Isoboard® Over Purlin Roof Insulation at sheet fixings. Maximum possible roof sheet temperatures exceed the maximum allowable working temperatures usually imposed on extruded polystyrene rigid foam. However, inspections of established Isoboard® Over Purlin Roof Insulation installations indicate only minor effects from heat. Minor indentations below sheeting troughs, over short lengths along purlin supports, can be expected to occur. Despite slight sheet settlements, both serrated nail and screw fixings hold sheets in place without undue play and without permitting rain penetration at exposed fixing points.

Possible noise occurring in some installations due to differential expansion and contraction between Isoboard® Over Purlin Roof Insulation and roof sheets. Certain over purlin insulation installations, where factory painted corrugated steel roof sheeting had been used, have been reported to be noisy (creaking and squeaking, usually triggered by small wind pressure variations). This has been attributed to differential thermal movements between roof sheets and insulation boards. Noise is found to be more severe where sheet fixings have not been installed in accordance with the sheet manufacturer's recommendations. The introduction of a slip sheet of plastic-coated paper has been found to greatly alleviate this noise.

SABS 0177 Part V
*Fire testing of materials,
components, and
elements used in
buildings*

Properties in relation to fire

Isoboard® Over Purlin Roof Insulation is considered to be a combustible material in terms of SABS 0177: Part V. However, large-scale fire tests indicate that insulation installed over purlins in a roof with a 3° pitch did not support any flame spread, while no significant flame spread occurred in insulation installed vertically between girts and side cladding. This is attributed to the thermoplastic nature of the material which ensures that the material melts or softens and falls out of the hot zone prior to reaching ignition temperature. When it melts, the foam structure of the polystyrene board collapses to approximately five percent of its original volume. Molten and softened material that did fall to the ground during the test did not burn and therefore poses a minimal risk.

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

SABS 0400 - 1990 *The application of the National Building Regulations*

Should polystyrene which has fallen into a fire ignite, the toxicity of the combustion products is less than that associated with, for instance, timber, mass for mass. Given the lack of flame spread in the event of fire, toxic gas emissions from Isoboard® Over Purlin Roof Insulation during combustion are not considered hazardous.

Agrément South Africa is of the opinion that Isoboard® Over Purlin Insulation will perform satisfactorily in the event of fire provided that the building in which it has been installed has been designed and constructed in accordance with the requirements of Part T, Fire Protection, of the National Building Regulations. This requirement will be satisfied where the building is the subject of an acceptable rational design prepared by a professional engineer or other approved competent person, or where the design, construction and equipment complies with the deemed-to-satisfy rules in Part T of Section 3 of SABS 0400. The designer's attention is drawn to the need for proper consideration of aspects such as occupancy, fire and smoke ventilation and the contents of the proposed building/structure.

During storage Isoboard® Over Purlin Roof Insulation must not be exposed to naked flame or other heat sources, for example it must not come into contact with naked light bulbs. Neither should the boards be stored near materials such as packing paper, waste or flammable liquids.

Durability of Isoboard® Over Purlin Roof Insulation

The water absorption characteristics of Isoboard® Over Purlin Roof Insulation will ensure that its durability during and after installation will be unaffected by moisture resulting from rain, snow, frost or water vapour. Isoboard® Over Purlin Roof Insulation is rot-proof, offers no food value to vermin and will not support mould or fungal growth.

Isoboard® Over Purlin Roof Insulation is affected by ultra-violet light, excessive temperature build up and solvents and materials containing volatile organic components which will adversely affect the polystyrene.

In exposed areas, especially at lower levels of insulated side cladding, the surface of boards may become scuffed or be cut by sharp objects or slightly damaged (dented) by soft body impacts.

Provided Isoboard® Over Purlin Roof Insulation is protected from physical damage and provided it is installed in accordance with the requirements of this certificate, Agrément South Africa is of the opinion that the board will remain durable for the life of the building in which it is installed.

Compliance with the National Building Regulations

In the opinion of Agrément South Africa, when used in the context of this certificate, Isoboard® Over Purlin Roof Insulation relates to the National Building Regulations as set out below when it is used as thermal insulation between roof sheeting and purlins or between side cladding and girts. Note that 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.

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

Part A: Administration. The materials described in Part 3 are deemed to satisfy the requirements of Regulation A13(1)(a).

Part T: Fire Protection. Clause T1(1) will be complied with provided the requirements of T1(2)(a) or (b) are met.

Quality management system

SABS ISO 9000 series
Quality management
systems

Quality control during manufacture. The quality management system adopted by the certificate holder meets Agrément South Africa's requirements which are based on the SABS ISO 9000 series and will ensure that the quality of manufacture of Isoboard® Over Purlin Roof Insulation will be consistently maintained.

Quality control during installation. Installation of this product is not the responsibility of the certificate holder but is the responsibility of the contractor who must install the insulation in accordance with the installation manual and this certificate. Technical support and installation manuals are available from the [certificate holder](#).

PART 3: TECHNICAL DESCRIPTION

The requirements for the manufacture, design, delivery, handling and installation that require special attention are given below.

General

Isoboard® Over Purlin Insulation is made from standard Isoboard® in various thicknesses to suit purlin spacings and required levels of thermal performance. It is used as a thermal insulating layer in new or renovated buildings. Purlins and girts may be of any conventional material.

Manufacture

Isoboard® insulation is an extruded polystyrene rigid foam board produced in a fully automated process in accordance with international specifications and standards. Boards are white or blue and 600 mm wide. For this application edges of boards are usually tongued-and-grooved while the ends of boards are square cut. Boards are manufactured in thicknesses of 25, 30, 40, 50 and 60 mm and up to 8 m long.

Design specification

Isofoam (South Africa) (Pty) Ltd offers technical support from Isoboard sales offices in Cape Town, Pretoria, Johannesburg and Durban. This support includes installation manuals and guidance using a dynamic thermal simulation tool (Isofoam Toolbox) to select the correct thickness of board to achieve specific conditions or energy usage inside buildings.

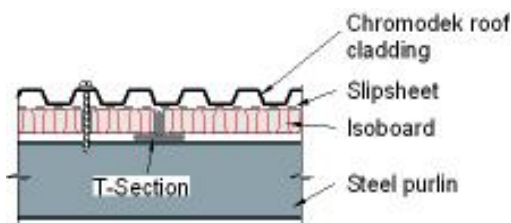
To ensure that Isoboard® Over Purlin Roof Insulation performs in accordance with the assessment given in [Part 2](#), the buildings in which the product is installed must be designed, constructed and equipped strictly in accordance with the requirements of Part T, [Fire Protection](#), of the National Building Regulations.

Maximum recommended spans for Isoboard® Over Purlin Insulation depends on board thickness, as indicated in the table below.

Board thickness (mm)	Maximum span between purlins or girts * (m)
25	1,2
30	1,5
40, 50 and 60	1,8

* for S-rib Chromadek roof sheets maximum spans must be reduced by 0,3 m

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



Under certain circumstances where boards are required to span distances greater than those recommended in the table above, aluminium T and top hat sections can be introduced between purlins at 600 mm centres, (ie at the edges of boards) to offer additional support. In this case the sides of boards are square cut and not tongued-and-grooved.

Roof designs based on stressed skin construction must be the responsibility of a professional engineer or other approved competent person.

Handling, delivery and storage

Boards are delivered to site in packs wrapped in light coloured, translucent plastic sheet. Isoboard® Over Purlin Insulation should be stored in a covered area, out of direct sunlight and ultra-violet rays. Boards must not be stored under dark or black plastic sheets in sunlight as excessive temperature build up under such sheeting could damage the board.

Boards must be stored flat and if they are exposed, they should be weighed down to prevent wind uplift and consequent damage.

Care must be taken to prevent boards coming into contact with solvents and materials containing volatile organic components which will adversely affect the polystyrene.

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

Care is required during handling to prevent damage to the face and tongued-and-grooved edges 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 and, if applicable, suitable cleaning agents and disinfectants should be obtained from the certificate holder.

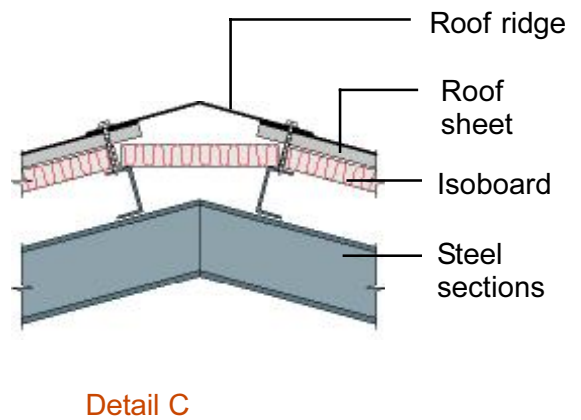
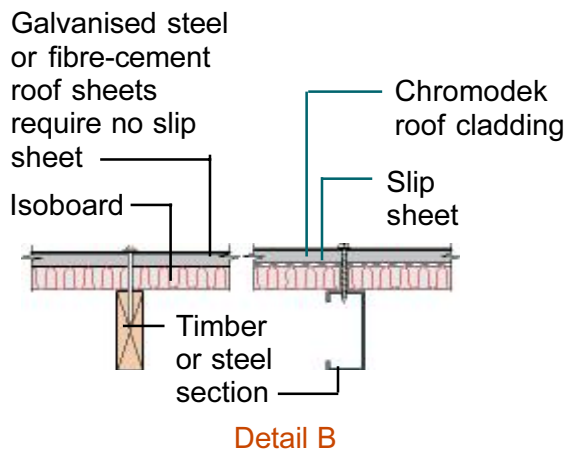
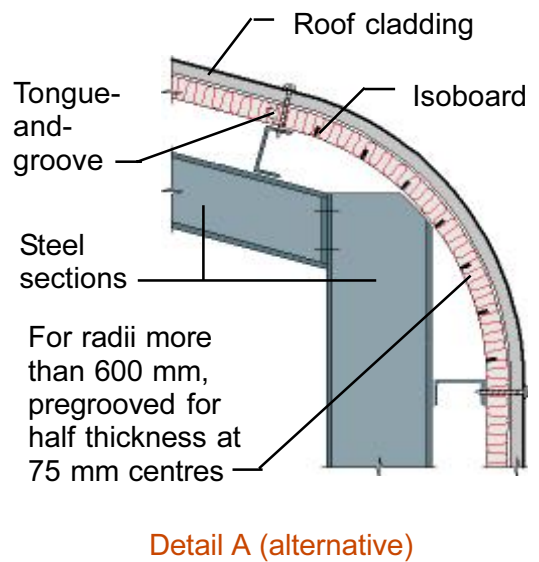
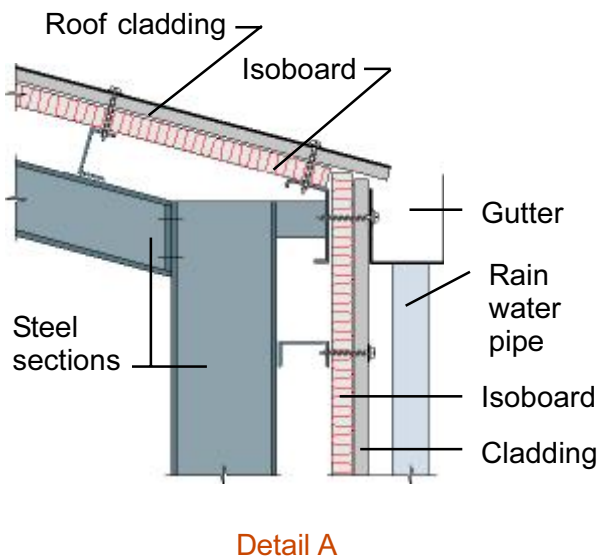
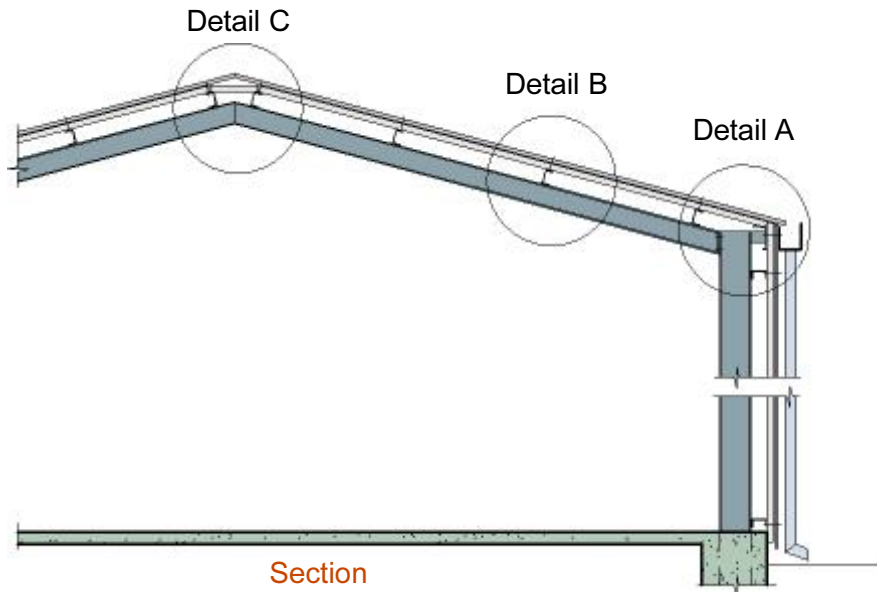
Installation

The installation of roof sheets and side cladding must be in accordance with the sheet and cladding manufacturer's recommendations. The thickness of the Isoboard® Over Purlin Roof Insulation must be taken into account when determining the length of fixings required.

Boards must be accurately cut to minimise gaps which occur at ridges, eaves and around penetrations through the insulation. They must be long enough to extend at least 100 mm beyond the first and last purlin or girt.

Boards are set out with their long axis at right angles to the purlins or girts.

Where boards must be joined, they are butt joined over the centre of a purlin. A 5 mm gap must be provided between the ends of adjacent boards at butt joints and the butt joints in any two adjacent rows of board must be staggered by a length equal to the spacing between purlins or girts.



Typical sections showing installation of Isoboard® Over Purlin Roof Insulation

Maintenance

Boards may be finished with water-based compatible paints. Small indentations, scratches, etc may be filled before painting with a compatible polymer-based filler that is not brittle.

Boards can be washed using high-pressure water jets, at specified water pressures, or by hand. A compatible detergent or if required, disinfectant, may also be used.

If boards are badly damaged, they can be replaced by first removing the roof sheets or side cladding. The tongues of replacement boards may have to be removed to allow the replacement boards to be installed. Boards may easily be cut with a sharp blade, fine-toothed saw or hot wire.