Agrément Certificate 2001/287
(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.

SANS 10400: *The application of the National Building Regulations*

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Subject:

Isoboard® Over Purlin Roof Insulation

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® Over Purlin Roof Insulation as a thermally insulating layer for use mainly in the following occupancies **(SANS 10400 PART A: Table 1 of Regulation A 920) (1))**:

- B1, B2 and B3 – High, Moderate and Low Risk Commercial Buildings
- D1, D2, D3 and D4 – High, Moderate, Low Risk Industrial Buildings and Plant Rooms
- J1, J2, J3 and J4 - High, Moderate, Low Risk Storage and Parking Garages

Isoboard® Over Purlin Roof Insulation is installed between roof sheeting and purlins or between side cladding and girts (sheeting rails).

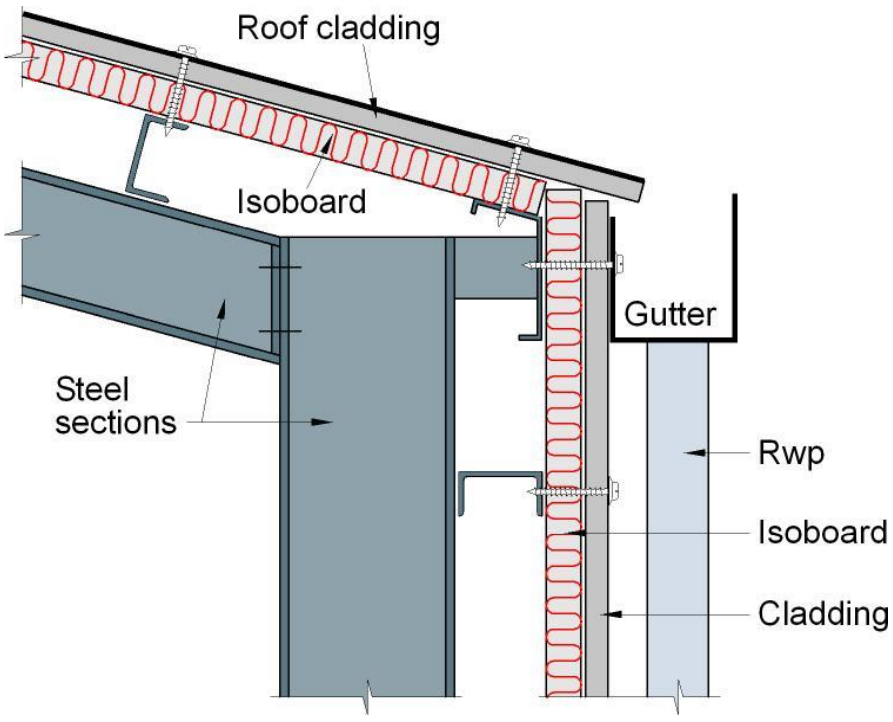
This certificate and Agrément South Africa's assessment apply only to Isoboard® Over Purlin Roof Insulation that is manufactured and installed as described and illustrated in this certificate, and where the terms and conditions of certification are complied with.

The certificate specifically excludes the use of Isoboard® Over Purlin Roof Insulation 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® Over Purlin Roof Insulation comprises an extruded polystyrene rigid foam board which is:

- white in colour
- 600 mm wide with the longitudinal edges of the boards bevelled and typically tongued-and-grooved. The ends of the boards are square-cut
- manufactured in standard thicknesses of 25, 30, 40, 50 and up to 80 mm.



Portal frame haunch showing typical Isoboard® Over Purlin Roof Insulation application

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PREAMBLE

This amendment 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

It is incumbent on the roofing installer to confirm with the roof sheeting manufacturer/supplier the appropriate fixing method for use with proprietary concealed fix clip fastening systems.

The original certificate with this subsequent review:

- has been granted after a technical appraisal of the performance of the Isoboard® Over Purlin Roof 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 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® 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.

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

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

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

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

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

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

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

Licensee – any person or company appointed by the certificate holder and registered with Agrément South Africa to manufacture Isoboard® Over Purlin Roof Insulation 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 manufactures the product 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® Over Purlin Roof Insulation

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

CERTIFICATE 2001/287
(Amendment October 2018)

AGRÉMENT SOUTH AFRICA
innovative construction product assessments

PART 1: CONDITIONS OF CERTIFICATION

This certificate covers the use of Isoboard® Over Purlin Roof Insulation when it:

- is manufactured and supplied by
  - the certificate holder or
  - a licensee appointed and registered as such with Agrément South Africa.
- is 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.

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® Over Purlin Roof Insulation. 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 together with the number of this certificate.

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® Over Purlin Roof Insulation
- 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

This assessment applies to those innovative aspects of Isoboard® Over Purlin Insulation as described in Part 3 of the certificate. It also applies to those conventional aspects of 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 a thermally insulating layer located between the top of purlins and the underside of roof sheeting or between girts and side cladding
- the method of fixing the insulating layer between purlins and roof sheeting or girts and side cladding.

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® Over Purlin Roof Insulation as described in the certificate is suitable for the uses specified (see page1).

The performance in use of Isoboard® roof and wall insulation installations will be such that the Isoboard® Over Purlin Roof Insulation 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® Over Purlin Roof Insulation 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® Over Purlin Roof Insulation have been determined in accordance with international standards	The materials used in the Isoboard® Over Purlin Roof Insulation are deemed to satisfy the requirements of regulation A13 (1) (a) Administration.
Behavior in relation to fire 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* 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*	Satisfactory. Although Isoboard® is considered to be combustible in terms of **SANS 10177: Part V**, it may be used in buildings of 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*. **SANS 428**: *Fire performance classification of thermal insulated building*	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 Provided that for occupancies or classifications: A1- A4; C1 and C2; E1 – E4; F1 – F3; G1; H1 – H5, as defined in Regulation A20, the energy usage requirements of Regulation XA are met.	The occupancies for which this application is mainly used, as listed on the first page of this certificate, do not fall within the scope of Regulation XA. As such no minimum requirements need be met for these 'uses' other than those that are deemed desirable by the building owners and tenants. Where the Isoboard® Over Purlin application is to be used in occupancies falling within the scope of the regulations, as listed in Regulation XA1 and as shown opposite, minimum energy usage requirements must be met. When meeting the requirements of Regulation XA1 via the deemed to satisfy Regulation XA3 a) the minimum prescribed thicknesses of Isoboard® required as roof insulation for the various Climatic Zones is as follows: - Climatic Zones 1, 2, 4 and 6: 100 mm, - Climatic Zone 3 and 5: 75 mm, while the minimum prescribed thickness of Isoboard® required when used in wall construction between girts and side cladding in the various Climatic Zones is as follows: - Climatic Zones 1 and 6: 60 mm, - Climatic Zones 2, 3, 4 and 5: 50 mm. However, when meeting the requirements of Regulation XA1 by means of equivalent energy usage requirements of Regulations XA3 b) or c) (Rational design by a competent person) thicknesses on Isoboard® less than those shown above may be permissible.
Structural performance	Satisfactory Provided the requirements of this certificate are complied with.	Isoboard® Over Purlin applications have been assessed for use where boards up to 80 mm thick are laid over purlins supported on beams or trusses. Should greater board thicknesses be required or where purlin rafters (purlins spanning, for example, between gable walls and not supported on intermediate beams or trusses) are to be used, the tendency of purlins and girts to bend laterally and to twist should be assessed by a competent person. Where necessary, sag rods or similar members are to be installed to strengthen purlins or girts against lateral bending and twisting.

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 insulation under roof sheets or behind side cladding. The thermal conductivity of Isoboard®, as is the case with other foam and rigid foam insulations, will increase over a period of years due to the effect of:
		• migration of gases
		• absorption of water as a result of:
		  ○ exposure to free water
		  ○ water vapour diffusion
		  ○ freeze-thaw cycling.
		However, extruded polystyrene (XPS - 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 the field in similar applications of between 8 and 21 years confirm an average thermal conductivity of 0.029 W/mK
		
		The U values for various thickness of insulation applied over purlins, under metal and fibre-cement roof sheets are shown in **Table 5**.

Condensation and possible corrosion of metal roof sheet	Satisfactory. However, as is the case with any form of similar insulation, surface and interstitial condensation can occur in most areas of South Africa.	Improved thermal performance will reduce the occurrence of condensation in buildings. Where activities within the building result in high levels of humidity, or where high levels of interstitial condensation are expected, the inner face of roof sheeting and side cladding as well as the inner face of sheets at sheet overlaps can corrode if not treated. Condensation which may form on the underside of cold metal sheet or other roof coverings may drip onto ceilings and penetrate ceilings at joints resulting in staining and water damage.
Ability of Isoboard® Over Purlin Roof Insulation to span between purlins	Satisfactory.	Short-term laboratory tests and inspections of completed buildings, some up to three years old, indicate that the specified maximum spans for different board thicknesses is sufficient to resist self weight and likely wind suction.

Effects of slight settlements of Isoboard® Over Purlin Roof Insulation at sheet fixings	Satisfactory. 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.	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.
Durability	Satisfactory. Provided Isoboard® Over Purlin Roof Insulation is protected from physical damage and is not exposed to ultra-violet light or the substances mentioned in the adjacent column, it will remain durable for the life of the building in which it is installed.	Isoboard® is rot-proof, offers no food value to vermin and will not support mould or fungal growth. Isoboard® can be affected by ultra-violet light, excessive temperature build-up and solvents and materials containing volatile organic components which will adversely affect the polystyrene. Where Isoboard® is vulnerable to impact damage, the boards may be replaced and damaged areas filled with a cellulose filler and sanded prior to redecoration.

Table 3: Quality Management System

Aspects of performance	Opinion of Agrément South Africa	Explanatory notes
Quality management	Satisfactory 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/ISO 9001** **SANS/ISO 9001** Quality management systems- Requirements'

PART 3: TECHNICAL DESCRIPTION

General description

Isoboard® Over Purlin Roof Insulation is an extruded polystyrene rigid foam board manufactured in thicknesses of 25, 30, 40, 50 and up to 80 mm to suit purlin or girt spacing and required levels of thermal performance.

Boards are supplied in lengths of 4.8 m up to 8 m.

Boards are laid transversely over purlins or girts which may be cold rolled steel or timber sections and directly under roof sheeting.

The longitudinal edges of the boards are typically tongued-and-grooved while the ends are square cut.

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 branched of Isofoam SA (Pty) Ltd and various outlets throughout the country. Isofoam SA (Pty) Ltd offers technical support throughout the country upon request.

Isoboard® has been assessed by EcoStandard South Africa in terms of Eco product assessment criteria and awarded a three star rating.

IsoBoard has no Ozone Depletion Properties.

Manufacture

Isoboard® Nail Up Insulated Ceilings are rigid closed cell foam boards manufactured from extruded polystyrene. Boards have a density 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).

Isoboard® Over Purlin Roof Insulation is an extruded polystyrene rigid foam board made from thicknesses of 25, 30, 40, 50 and up to 80 mm to suit purlin or girt spacing and required levels of thermal performance.

Boards are supplied in lengths of 4.8 m up to 8 m.

Isoboard® Over Purlin Roof Insulation is manufactured by Isofoam (South Africa) (Pty) Ltd in its factory in Atlantis Industria. Isofoam SA (Pty) Ltd distributes the product throughout sub-Saharan Africa.

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 Over Purlin Insulation installation are set out in Table 3.

Table 3

Property	Standard Test Procedure	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)	0,0280 $^{W}/_{mK}$
* 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® must be stored flat in covered areas away from direct sunlight and ultra-violet light. Care must be taken to prevent boards coming into contact with solvents and materials containing volatile organic components which will have adverse effects on the polystyrene.

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

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

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 is taken into account when determining the length of fixings required.

Boards are accurately cut to minimise gaps which occur at ridges, eaves and around penetrations through the insulation. They are 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 purlin or girt.

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

Table 4 shows the Maximum spans for Isoboard® Over Purlin Roof Insulation depending on board thickness.

Maximum spans
Note: For traditional corrugated roof sheeting maximum spans must be reduced by 0, 3 m

Table 4:

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

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, (i.e. 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 design based on stressed skin construction is the responsibility of a professional engineer or other approved competent person.

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

Table 5 shows the calculated U values of metal and fibre-cement sheeted roof insulated with different thicknesses of Isoboard®.

Thermal conductivity value of 0,030 $Wm^{-1}K^{-1}$ has been assumed

Table 5

Construction	**U value of construction ($Wm^{-1}K^{-1}$) with Isoboard® Over Purlin Roof Insulation (mm)**				
Thickness (mm) of Isoboards® insulation	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

Maintenance

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

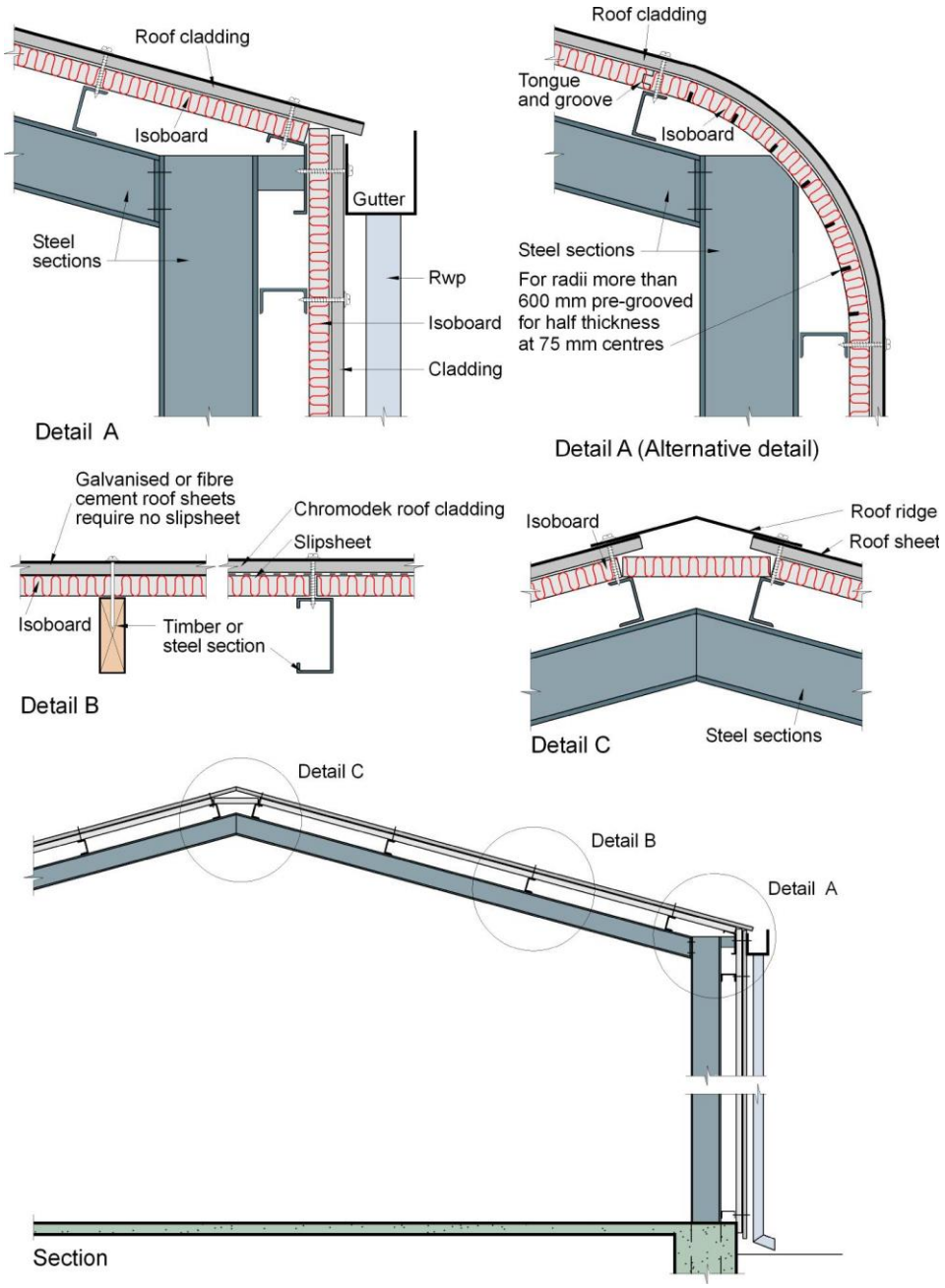
Boards can be washed using high-pressure water jets, at specified water pressures, or by hand. A compatible detergent or, if required, disinfectant, may also be used.

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

Technical support

Isofoam (South Africa) (Pty) Limited offers technical support from Isoboard® sales offices.

This technical support includes *installation manuals* and guidance regarding expected thermal performance and in the selection of the correct thickness of board to use to achieve specific conditions or energy usage inside buildings.



Typical sections showing installation of Isoboard® Over Purlin Roof Installation