TECHNICAL

metecnotherm®

MetecnoTherm®
MetecnoTherm FC®
MetecnoTherm PB®
MetecnoTherm® UnderSlab
MetecnoCast®

DESIGN & INSTALL GUIDE

meTecno®

A New Standard in Insulated Board Systems

Contents

MetecnoTherm® Design & Install Guide

Metecno

More than just the leading manufacturer of insulated panels.

The Metecno business has a long history of operations in Australia that can be traced back to the 1950's. Metecno has developed full systems and solution for the total building envelope.

Metecno supports Australian Standards for the Australian building environment. All our products and systems are tested to the relevant Australian standards. We continue to develop new products and re-invest in Australia.

Warranty

In business, your reputation is everything and minimising risk makes sound business sense. Metecno's range for thermal insulated cladding will give you the peace of mind you've chosen a quality material that conforms to relevant Australian standards and backed by a warranty you can count on.

Support

Metecno has technical and support associations with a number of international building product suppliers as well as relationships with leading universities and research facilities in Australia.

AS/NZ Standards

The MetecnoTherm® range has been tested to AS ISO 9705, Reaction to fire tests - Room corner test for wall and ceiling lining products and AS 5637, Determination of fiire hazard properties.

Superior Thermal

MetecnoTherm® offers superior thermal properties.

MetecnoTherm® is light weight, aesthetically pleasing, with a fully finished exterior.

Delivered to site

Being the manufacturer, Metecno can control the time lines and quality to suit your needs. Our Australian leading manufacturing centres located in Brisbane and Melbourne, are able to turn around large volumes in short times. Once manufactured, MetecnoTherm® is delivered to your site to be installed.

www.metecnopir.com.au

Thermal Building Solutions

Metecno supports Australian Standards for the Australian building environment. All our products and systems are tested to the relevant Australian standards. We continue to develop new products and re-invest in Australia.

metecnotherm®

CodeMark Australia Certificate CM40415 CMI Certification

Commercial Industrial Agricultural

Product Description

MetecnoTherm® sets new standards in PIR insulated board systems. It is a cost effective insulation solution for integration into many applications in commercial or residential markets where rigid insulation boards are required. PIR (Polyisocyanurate) is a medium density thermoset, high strength foam with excellent thermal, acoustic and fire performance properties. We have you covered where improved fire performance is required and an inspiring interior finish is desired.

PIR

The Industrial Specialist

Note that other provisions within the BCA, such as a reduction in ceiling area insulated due to the installation of recessed down lights or other fixtures, may affect the level of insulation required. Similarly, to meet the deemed-to-satisfy provisions in the NCC other measures for energy efficiency, such as glazing requirements, must also be met.

Available in a Variety of Finishes

Sustainable Product | Reduce Energy Costs | Commercial & Industrial | Code Compliant | Reduce Energy Costs

Techincal Specifications

Core	PIR (Fire-retardant Polyisocyanurate)
Width	1200mm
Thickness	MetecnoTherm® - 25 to 100 in 5mm increments
Length	2400mm (other length available on request)
External Material	Paper, Foil, White Fibreglass
Internal Material	Paper, Foil, White Fibreglass
Material Group Numbers	Group 2, 3, 4*
Environmental	Zero Ozone Depleting Potential (ODP)
Fire hazard properties	AS/NZS 1530.3
Ignitability Index	0
Spread of Flame Index	0
Heat Evolved Index	0
Smoke Index	2

Properties

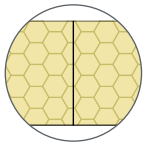
MetecnoTherm® Panel Properties								
Panel Thickness (mm)	25	40	50	60	70	80	90	100
Typical Mass (kg/m²)	0.9	1.5	1.9	2.3	2.6	3.0	3.4	3.8
Declared R-value (m²K/W) at 23˚C (AU)	1.05	1.70	2.15	2.55	3.00	3.40	3.85	4.30

Note: The Declared R-value is at 23˚C in accordance with AS/NZS 4859.1:2018 & AS/NZS 4859.2:2018. Contact us for other temperatures.

*Required Group Number must be specified on the order.

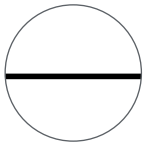
Dimensions

Joint



Flush Joint

Profiles



Plain

www.metecnopir.com.au

metecnotherm PB®

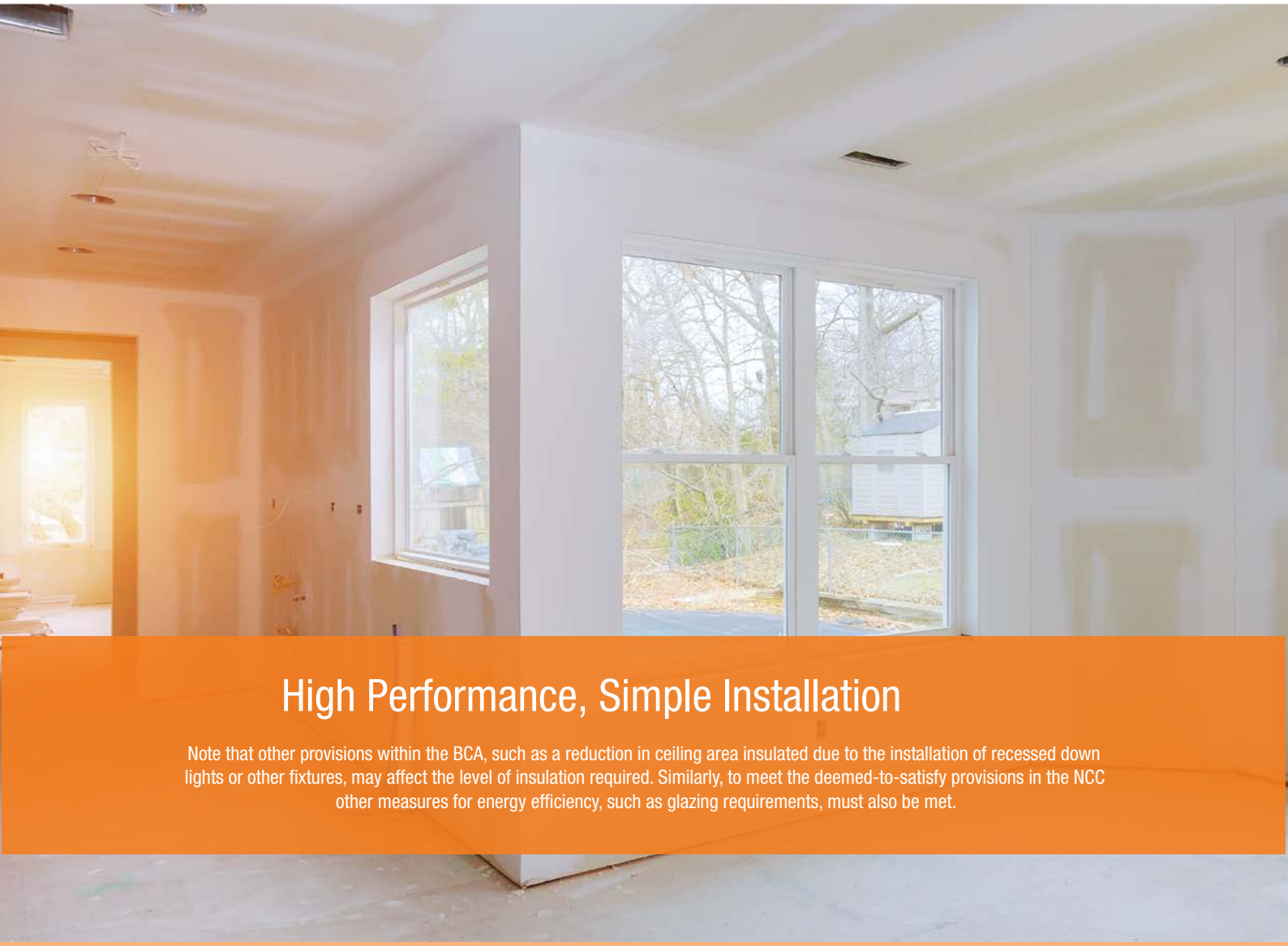
Certificate CM40415

Commercial Industrial Agricultural

Product Description

MetecnoTherm PB® combines the thermal and fire performance of MetecnoTherm® PIR high strength rigid insulation with finished surface of Plasterboard sheeting. Ideal for internal soffit and walling installations where access to a cavity to install flexible insulation is not possible. Available with 10mm and 13mm non-combustible NCC Group 1 fire classification Plasterboard tapered edge outer facing. MetecnoTherm PB® offers the potential for a fast installation of an internal lining, as the bonded PIR insulation and Plasterboard sheet surface material are installed in the one process.

PIR



High Performance, Simple Installation

Note that other provisions within the BCA, such as a reduction in ceiling area insulated due to the installation of recessed down lights or other fixtures, may affect the level of insulation required. Similarly, to meet the deemed-to-satisfy provisions in the NCC other measures for energy efficiency, such as glazing requirements, must also be met.

Next Generation Plasterboard

Technical Specifications

Core	PIR (Fire-retardant Polyisocyanurate)
Width	1200mm
Thickness	MetecnoThermPB® - 35 to 110 in 5mm increments (with 10mm PB) MetecnoThermPB® - 38 to 113 in 5mm increments (with 13mm PB)
Length	2400mm (other length available on request)
External Material	Paper, Foil, White Fibreglass
Internal Material	10mm, 13mm Plasterboard
Acoustic Properties	Rw 27 (with 10mm or 13mm PB)
Material Group Numbers	Group 1
Environmental	Zero Ozone Depleting Potential (ODP)
Fire hazard properties	AS/NZS 1530.3
Ignitability Index	0
Spread of Flame Index	0
Heat Evolved Index	0
Smoke Index	2

Properties

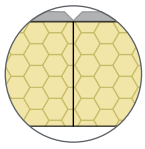
MetecnoThermPB® (with 10mm PB) Panel Properties

Panel Thickness (mm)	35	50	60	70	80	90	100	110
Typical Mass (kg/m^2) based on 10mm PB	6.6	7.2	7.6	8.0	8.3	8.7	9.1	9.5
Declared R-value (m^{2}K/W) at 23˚C (AU)	1.10	1.75	2.20	2.60	3.05	3.50	3.90	4.35

Note: The Declared R-value is at 23˚C in accordance with AS/NZS 4859.1:2018 & AS/NZS 4859.2:2018. Contact us for other temperatures.

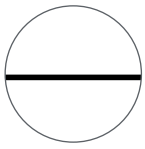
Dimensions

Joint



Flush Joint

Profiles



Plain

www.metecnopir.com.au

metecnotherm FC®

Certificate CM40415

Commercial Industrial Agricultural

Product Description

MetecnoTherm FC® combines the thermal and fire performance of MetecnoTherm® PIR high strength rigid insulation with the durability and weather resistance of Fibre Cement sheeting. Ideal for semi exposed soffit and walling installations where access to a cavity to install flexible insulation is not possible. Available with 4.5mm and 6.0mm non-combustible NCC Group 1 fire classification Fibre Cement outer facing. MetecnoTherm FC® offers the potential for a fast installation of an internal lining, as the bonded PIR insulation and Fibre Cement sheet surface material are installed in the one process.

PIR

High Performance, Simple Installation

Note that other provisions within the BCA, such as a reduction in ceiling area insulated due to the installation of recessed down lights or other fixtures, may affect the level of insulation required. Similarly, to meet the deemed-to-satisfy provisions in the NCC other measures for energy efficiency, such as glazing requirements, must also be met.

Professional Solutions for Fibre Cement


Sustainable Product


Reduce Energy Costs

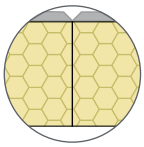

Commercial & Industrial

Code Compliant

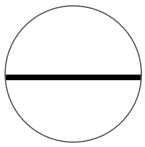

Reduce Energy Costs

Dimensions

Joint


Flush Joint

Profiles


Plain

Technical Specifications

Core	PIR (Fire-retardant Polyisocyanurate)
Width	1200mm
Thickness	29.5 to 104.5 in 5mm increments (with 4.5mm FC) 31 to 106 in 5mm increments (with 6.0mm FC)
Length	2400mm (other length available on request)
External Material	Paper, Foil, White Fibreglass
Internal Material	4.5mm, 6.0mm Fibre Cement
Acoustic Properties	Rw 26 (with 4.5mm FC) Rw 27 (with 6.0mm FC)
Material Group Numbers	Group 1
Environmental	Zero Ozone Depleting Potential (ODP)
Fire hazard properties	AS/NZS 1530.3
Ignitability Index	0
Spread of Flame Index	0
Heat Evolved Index	0
Smoke Index	2

Properties

MetecnoThermFC® (with 6mm FC) Panel Properties

Panel Thickness (mm)	31	46	56	66	76	86	96	106
Typical Mass (kg/m^2) based on 6mm FC	10.4	11.0	11.4	11.8	12.1	12.5	12.9	13.3
Declared R-value (m^{2}K/W) at 23˚C (AU)	1.10	1.70	2.15	2.60	3.00	3.45	3.90	4.30

Note: The Declared R-value is at 23˚C in accordance with AS/NZS 4859.1:2018 & AS/NZS 4859.2:2018. Contact us for other temperatures.

www.metecnopir.com.au

metecnotherm® UnderSlab

CodeMark Australia Certificate CM40415

CMI Certification

Commercial | Industrial | Residential | Agricultural

Product Description

MetecnoTherm® UnderSlab is a modified Polyisocyanurate (PIR) rigid insulation board used as part of a built up system to insulate concrete foundations. Consisting of a PIR rigid foam core sandwiched between layers of aluminium facings and with zero ozone depleting potential, MetecnoTherm® is the logical choice for high thermal performance and building sustainability.

PIR

High Performance, Simple Installation

Excellent thermal and fire hazard performance
Compliant with AS4859.1 2018 and NCC
Environmental Product Declaration and Life Cycle Analysis
Australian Made

Technical Information

Specification

The UnderSlab insulation shall be MetecnoTherm®, comprising foil faced PIR rigid board with a thickness of 30–50mm and declared thermal value of R1.25–R2.15 installed between 2 damp-proof membranes and ensuring product is not directly exposed to subsoil or concrete. Installation to occur in compliance with published literature from Metecno PIR.

Product R Value

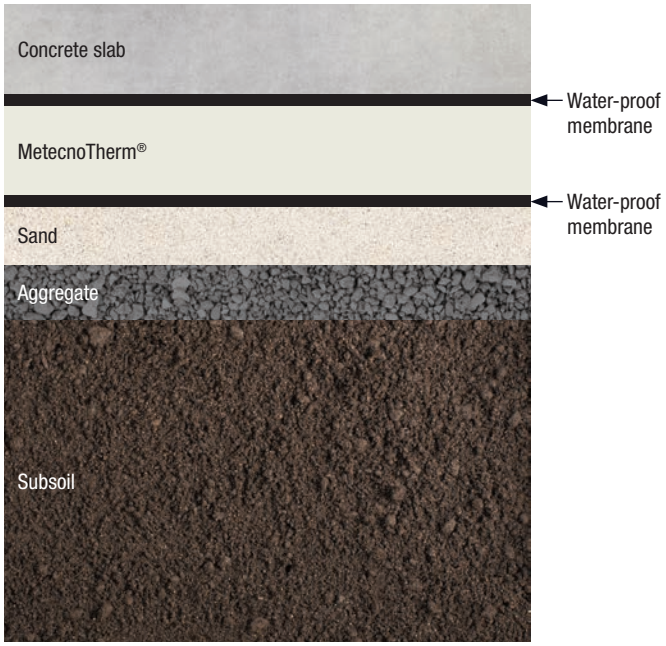
Product Thickness	Declared R value @ 23°C
30mm	R1.25
40mm	R1.70
50mm	R2.15

Product Data

Criteria	Relevant Standard	Metric
Declared Thermal Conductivity AS/NZS 4859.1 2018	AS4859.1 2018	0.024W/m.K @ 23°C
Ignitability Index	AS/NZS 1530.3 1999	0
Spread of Flame Index	AS/NZS 1530.3 1999	0
Heat Evolved Index	AS/NZS 1530.3 1999	0
Smoke Developed Index	AS/NZS 1530.3 1999	2
Compressive Strength	AS1366.2/AS2498.3	>100kPa
Water Vapour Transmission @ 38°C/88.5% RH	AS1366.2/AS2498.5	579 µg/m^{2}s
Water Absorption	AS1366.2/AS2498.8	0.14%

Installation Instructions

1. Once subsoil and aggregate is compacted and level with a layer of sand, lay adequate micron water-proof membrane to DPC level taking care to lap and fold joints to ensure no moisture ingress.
2. The membrane should be raised at edges to fully contain and link the finished DPC.
3. Lay MetecnoTherm® with joins loosely in contact.
4. If using a second layer of MetecnoTherm®, lay with offset joins so 2 layers are not configured the same way.
5. Overlay adequate micron water-proof membrane over MetecnoTherm®, taking care to tape joins fully to prevent concrete penetrating the joints.
6. MetecnoTherm® is not to be placed under direct point loads.
7. Pour the concrete slab as normal.



metecnocast®

Certificate CM40415

Commercial Industrial Agricultural

Product Description

MetecnoCast® traditional insulated sandwich panels, comprised of a thin fascia wythe, MetecnoTherm® insulation and a much thicker structural wythe would typically fall into this system. This system is comprised of HK Standard non-conductive wall tie and MetecnoTherm PIR® (Polyisocyanurate) rigid insulation boards, a medium density, high strength foam with excellent thermal, acoustic and fire performance properties.

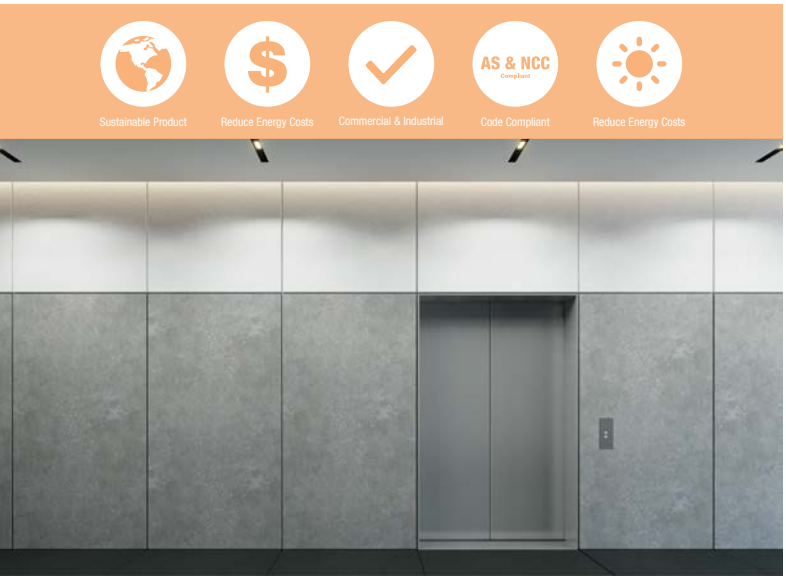
This system is designed to create a non-composite insulated concrete sandwich panel. This allows the two wythes of concrete to be tied together with a non-conductive wall tie but still allow the two layers to shrink or expand independently of one another using the tie for deflection. High strength and low thermal conductivity. High-performance, alkaline resistant, engineered thermoplastic tie. In place temperature range -40°C to 90°C

PIR

High Performance, Simple Installation

Note that other provisions within the BCA, such as a reduction in ceiling area insulated due to the installation of recessed down lights or other fixtures, may affect the level of insulation required. Similarly, to meet the deemed-to-satisfy provisions in the NCC other measures for energy efficiency, such as glazing requirements, must also be met.

Professional Solutions for Concrete Sandwich Panels



Technical Specifications

Core	PIR (Fire-retardant Polyisocyanurate)
Width	1200mm
Insulation Thickness	From 50mm to 127mm (other thicknesses on request)
Length	2400mm (other length available on request)
Fasica Thickness	Concrete 50mm - 100mm
Tie Length	135mm to 209mm (dependent on thickness of PIR core)
Embedment Depth	38mm
Diameter Through Foam	12.5mm - 14.5mm (dependent on thickness of PIR core)

HK Ties Standard System	50mm	64mm	75mm	89mm	100mm	114mm	127mm
Ultimate Tesnile/Pullout	4.89kN	4.89kN	7.37kN	6.67kN	7.37kN	6.67kN	6.67kN
Shear Strength	2.22kN	1.78kN	4.11kN	2.22kN	3.47kN	2.22kN	2.22kN

Environmental	Zero Ozone Depleting Potential (ODP)
Fire Performance	Resist 136 kg tension load for over 90 minutes when fire tested per Section 7.4.3 of ASTM E1512-01
Thermal Conductivity	0.30 W / m °K

Properties

MetecnoTherm® Panel Properties								
Panel Thickness (mm)	25	40	50	60	70	80	90	100
Typical Mass (kg/m²)	0.9	1.5	1.9	2.3	2.6	3.0	3.4	3.8
Declared R-value (m²K/W) at 23°C (AU)	1.05	1.70	2.15	2.55	3.00	3.40	3.85	4.30

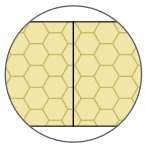
Note: The Declared R-value is at 23°C in accordance with AS/NZS 4859.1:2018 & AS/NZS 4859.2:2018. Contact us for other temperatures.

The Total R-value of MetecnoCast can be calculated by adding the R-value of the concrete to the above values.

Pre-drilling available on request.

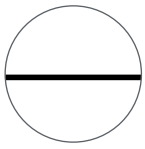
Dimensions

Joint



Flush Joint

Profiles



Plain

www.hkties.com

www.metecnopir.com.au

Storage

Panels should always be kept dry and if placed on site, stored off the ground, slightly inclined, allowing adequate drainage and ventilation of the panel pack. No other materials to be stored / stacked on top of panel pack. Panels must be dry prior to fixing, jointing and finishing.

Handling

In the event of manual handling, careful consideration should be given to panel weight and appropriate PPE. Consider using mechanical aides if necessary.

Safety

The contractor is to determine and use safe working methods throughout the installation and construction period, in compliance with OHS requirements. When cutting panels using power tools, always ensure the work area is well ventilated. An approved dusk mask (AS/NZS 1715), safety glasses (AS/NZS 1337) and appropriate hearing protection must be worn. When cutting MetecnoTherm FC® a vacuum extractor must be equipped to the plunge saw.

Panel Cutting

Panels may be cut on-site using the following methods. When cutting both MetecnoTherm PB® and MetecnoTherm FC®, use recommended plunge saw equipped with fibre cement blade to cut through the sheet surface, then finish cutting through the panel thickness with fine tooth hand saw where required.

Recommended Cutting Tools & Components

When necessary use of power tools are required for cutting panels, use power saws equipped with appropriate vacuum extraction systems and blades specifically designed for use with fibre cement products.

When installing MetecnoTherm FC®, use standard gyprock and fibercement finishing tools and components as necessary.

Contact us for further technical assistance

Installation Methods

In all cases, the boards should be installed with consideration to the requirements of AS 3999 – bulk thermal insulation – installation. Additionally, MetecnoTherm FC® should be installed with consideration to the requirements of AS/NZS 2908.2 – Cellulose-cement products & AS 3999 – bulk thermal insulation – installation.

metecnotherm®

metecnotherm PB®

metecnotherm FC®

1. Direct Fixing

MetecnoTherm® and MetecnoTherm® FC & PB are produced in the standard size of 2400mm x 1200mm, with a PIR core thickness varying from 25mm to 100mm.

The type and arrangement of fasteners depend on the product being used, applicable loads, and the application.

The guidelines provided here are based on the assumption that no additional loads are applied to the fixings or the boards, other than the designated wind pressure and the self-weight of the product. The boards are not considered trafficable, they cannot be used for storage or for support of ceiling services.

The boards should not be exposed to high temperatures, moisture, or UV light during service. Board joints could be squared or staggered as shown in Figures 1.2 & 1.3 for architectural requirements. Fixing into flat soffits or bases are desirable. The boards should not be pressed hardly against each other during installation.

1.1 Direct Fixing to Concrete

1.1.1 Fixing MetecnoTherm® to Concrete Soffits and Walls

A. MetecnoTherm® Panels can be used to line soffits and walls. There are several options for fixing the panels directly to concrete slabs/block walls. These fixing patterns are shown in figure 1.1. The optimum number of fixings needs to be selected based on the internal pressure, fixing capacity and the panel thickness. The maximum “span over deflection” ratio under serviceability wind load has been limited to 150.

B. As shown in figure 1.1, the minimum number of fixings per panel can vary from 5 to 11. Ideal fixing combinations of 5, 6, 10 and 11 have been selected based on full scale testing. Having determined the Ultimate Limit State (ULS) wind pressure on the panels and the required design capacity of the fasteners the most suitable fixing pattern for a given panel thickness can be selected from Table 1. Refer Figure 1.1 for fixing intervals and edge distance. Contact Metecno® for higher pressures and any other deviations.

C. There are several insulation fasteners that are compatible with MetecnoTherm® Panels. Minimum head diameter of all fasteners must be 60mm and deformation of the fastener head at service should be within the acceptable limit. The capacity of available insulation fasteners can vary from 0.15kN to 0.4kN. High capacity (1-3kN) mechanical anchors are also available where required. Refer manufacture’s specifications for most up-to-date information on the fastener length selection, pull-out capacity and installation details. It is important to note that a minimum fastener head or washer diameter of 60mm is required for any fasteners used with MetecnoTherm® insulation.

D. All panel joints may be taped using insulation tape to the project specifications where needed. Panel joints and the perimeter can be sealed if necessary, to prevent airflow at the interface and to minimize moisture ingress.

Table 1: Minimum Required Design Pull-Out Capacity of the Fasteners - Region A & B

ULS Pressure (kPa)	Panel Thickness (mm)	Minimum Required Design Pull-Out Capacity of the Fasteners* (kN)			
		5 Fixings	6 Fixings	10 Fixings	11 Fixings
0.25	25	-	0.15	0.10	0.07
	30-100	0.18			
0.50	25	-	-	0.19	0.13
	30-40	-	0.30		
	45-100	0.36			
0.75	25-35	-	-	0.29	0.20
	40-55	-	0.45		
	60-100	0.54			
1.00	25	-	-	-	-
	30-45	-	-	0.39	0.27
	50-75	-	0.60		
	80-100	0.72			
* Minimum diameter of the fastener head is 60mm. For higher pressures contact Metecno®.					

1. Direct Fixing (cont'd)

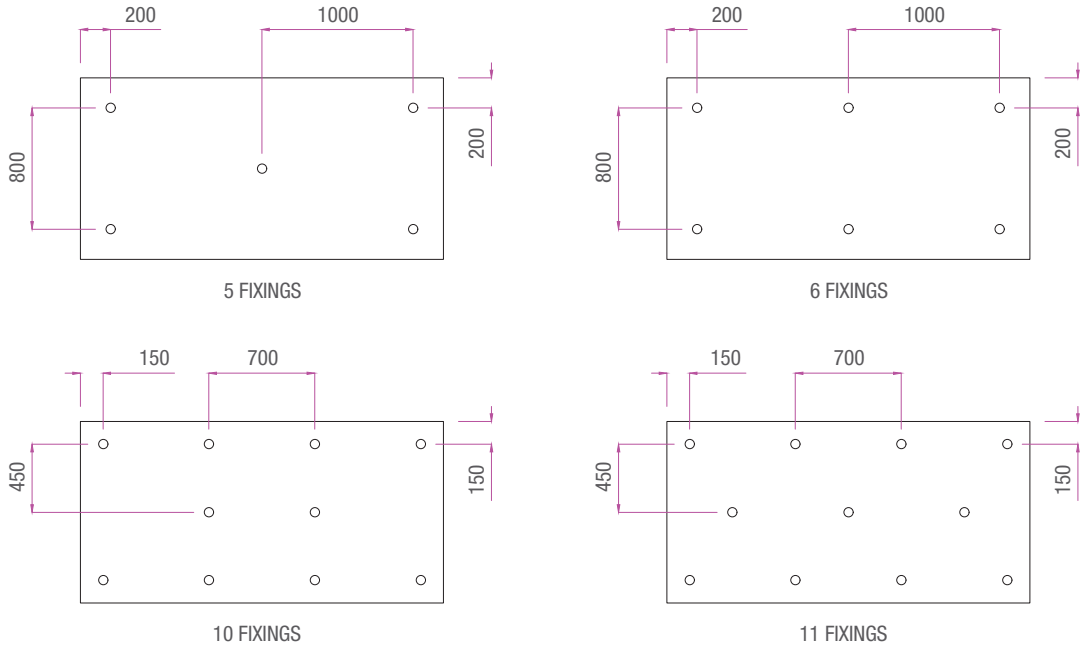


Figure 1.1. Fixing Arrangement of MetecnoTherm®

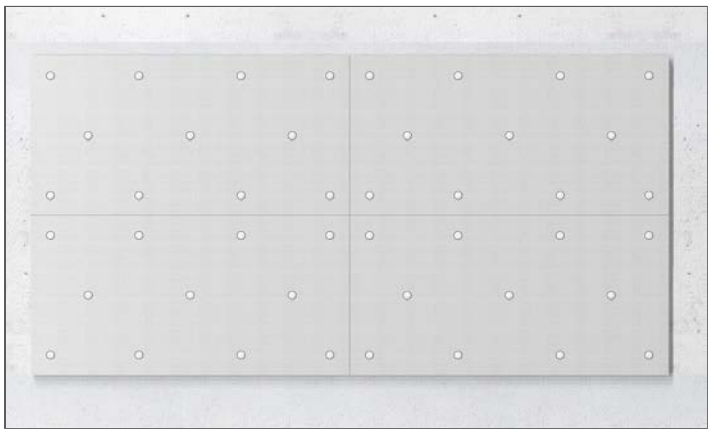


Figure 1.2. Board Joints Aligned. Fastener Pattern (11 Fixings per Board).

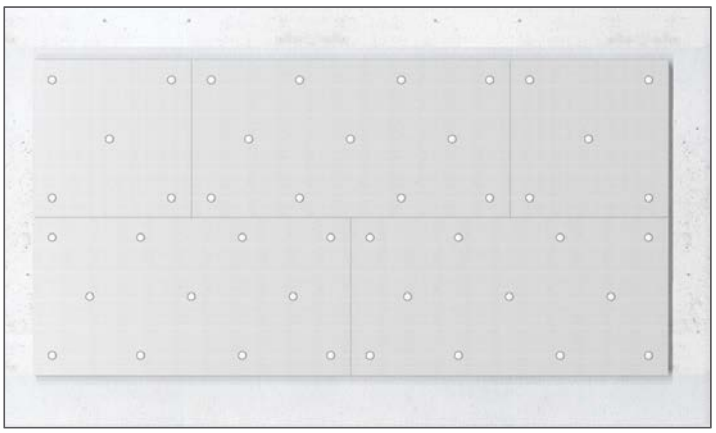


Figure 1.3. Board Joints Staggered

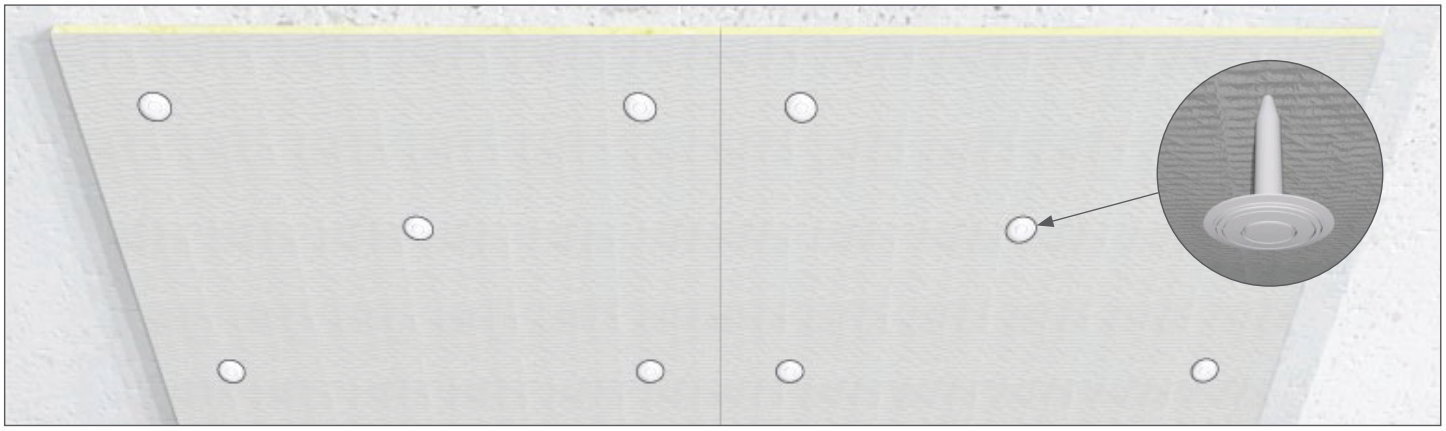


Figure 1.4. Insulation Fastener

1. Direct Fixing (cont'd)

1.1.2 Fixing MetecnoTherm® FC & PB to Concrete Soffits

A. The boards must be fixed directly to the concrete soffit using a minimum of 11 insulation fasteners, with incorporated washer head diameter of 30 mm (min). The fasteners should provide a minimum embedment of 40mm into the solid substrate and they must be evenly distributed over the entire surface of the board. (Note: The substrate and fixing materials must be fit for purpose. Design loading on the board is not to exceed 0.375kPa for this fixing pattern. Additional fixings may be required when the boards are subjected to greater wind loads.) Please contact Metecno for advice.

B. Use two rows of 4 fasteners along the length, between 50 to 150mm from edge of the board; and 3 fasteners along the middle in an offset position from the exterior rows of fasteners as shown in figure 1.2.
Repeat steps to install the board in a continuous layer on the underside of the concrete soffit.

C. Finish boards flush with jointing compounds and standard finishing components.

Figure 1.0. Direct Fix to Concrete Soffit

1.2 Direct Fixing of the Boards to Masonry and / Concrete Wall

1.2.1 With Construction Adhesive Bonding

A. Using construction adhesive, the board can be installed directly to dry and structurally sound walls free from moisture penetration. The wall should also be free from contaminant (e.g. oil, grease, paint) that may affect the adhesive bonding.

B. Ensure the existing walls are straight and plumb, and remove any protrusions that could result in an irregular surface finish.

C. Apply a continuous bead of construction adhesive around the perimeter of the wall, and penetrations such as doors and windows.

D. Apply 25mm diameter blobs of construction adhesive at 300mm CRS across the width and height, to the back of the board, or directly on to the wall. Ensure that no blob is closer than 25mm to any edge of the board to ensure a clean joint between boards.

E. Align the board on the wall so that all joints butt tightly and apply pressure to ensure the board is plumb and true.

F. Temporary support may be required to support the board, in cases where the construction adhesive does not develop immediate grab.

G. Mechanical fixings may be used to complement the adhesive bond. In this case, after the adhesive has set, use 2 mechanical fixings at the mid height of the board, 15mm from the edge, with a 25mm nominal embedment into the wall.

H. Mechanical fixings should be positioned in the tapered edge of the plasterboard which will be covered after installation.

I. Repeat steps to install the boards and ensure there are no gaps between segments or abutments with other materials.

Figure 1.5. Concrete Wall

Contact us for further technical assistance

1. Direct Fixing (cont'd)

1.2.2 With Mechanical Fixing

A. The boards can be mechanically fixed, if an acceptable adhesive bond cannot be achieved due to the wall surface conditions.

B. Screws should be fixed at a maximum of 600mm CRS horizontally and 300mm vertically as shown in figure 1.6. (Note: The substrate and fixing materials must be fit for purpose. Design loading on the board is not to exceed 0.375kPa for this fixing pattern. Additional fixings may be required when the boards are subjected to greater wind loads.) Please contact Metecno for advice.

C. Ensure that the existing walls are straight and plumb, and remove any protrusions that may result in an irregular surface finish.

D. Predrill the wall substrate using a suitable masonry drill bit.

E. Insert the masonry anchor with a minimum embedment of 25mm into the solid substrate.

F. Ensure the fixings are driven straight, with the heads embedded just below the surface of the plasterboard. Do not overdrive screws.

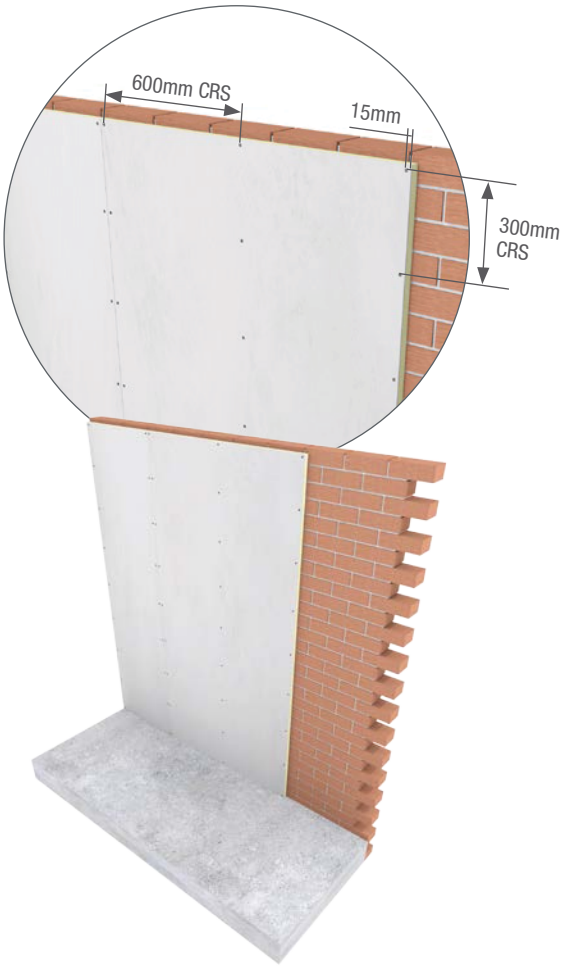


Figure 1.6. Masonry Brick or Block Wall

2. Fixing to Metal or Timber Battens

A. If direct fixing is not possible due to uneven surface or the presence of mechanical services, the boards can be fixed to metal or timber battens.

B. Suitable metal battens or 50 x 25 mm timber battens are required at 600mm CRS. This will result in three rows of battens, lining up with the two edges and the centre of the boards. The battens are to be fixed to the soffit as per manufacturer's recommendations.

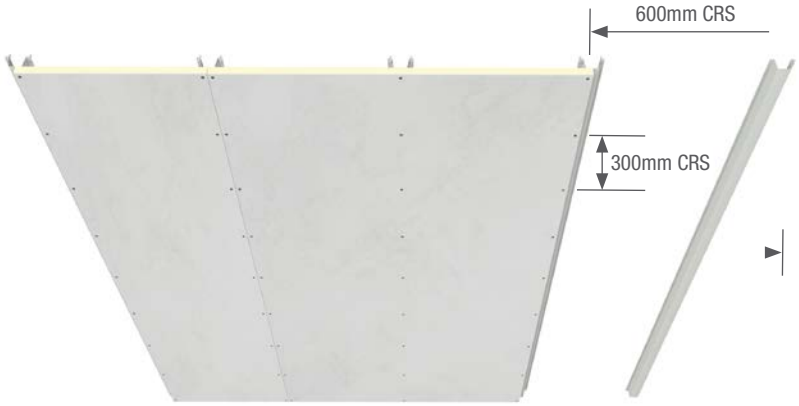


Figure 2.0. Metal Battens

Contact us for further technical assistance

Figure 2.1. Concrete Wall

2. Fixing to Metal or Timber Battens (cont'd)

C. Use screws at a maximum of 300mm CRS to fix the boards to the furring metal battens. For timber battens use screws or nails at a maximum of 200mm CRS. The screws or nails must be in rows less than 600mm apart. (Note: The substrate and fixing materials must be fit for purpose. Design loading on the board is not to exceed 0.375kPa for this pattern. Additional fixings may be required when the boards are subjected to greater wind loads.)
Please contact Metecno for advice.

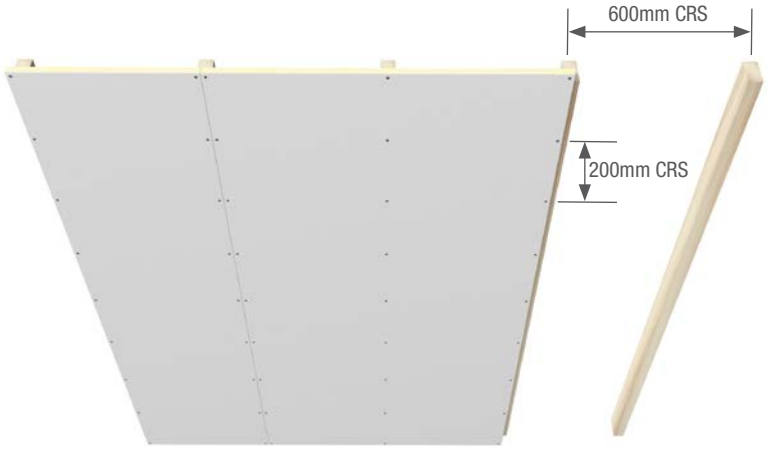


Figure 2.3. Timber Battens

Figure 2.4. Masonry Brick or Block Wall

3. Service Penetrations

A. Installation of the boards should tightly fit around penetrations and fire collars to reduce the effect of thermal bridging. Use appropriate methods to fill in the gaps where there is danger of overheating around flues, electrical cables and equipment.

Contact us for further technical assistance

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