

Foamular Metric XPS in Precast Applications

Foamular Metric XPS Insulation and HK low conductivity ties are specifically designed for use in site cast or precast insulated concrete sandwich panels.

These products provide a fast, efficient cost effective method of improving the thermal performance of concrete buildings.

Typical concrete panels must be insulated after casting and erection. Using Foamular Insulation and HK Ties, the panel is insulated during casting, prior to erection. Thus the insulation is integral to the wall.

The result is efficient and cost effective construction.

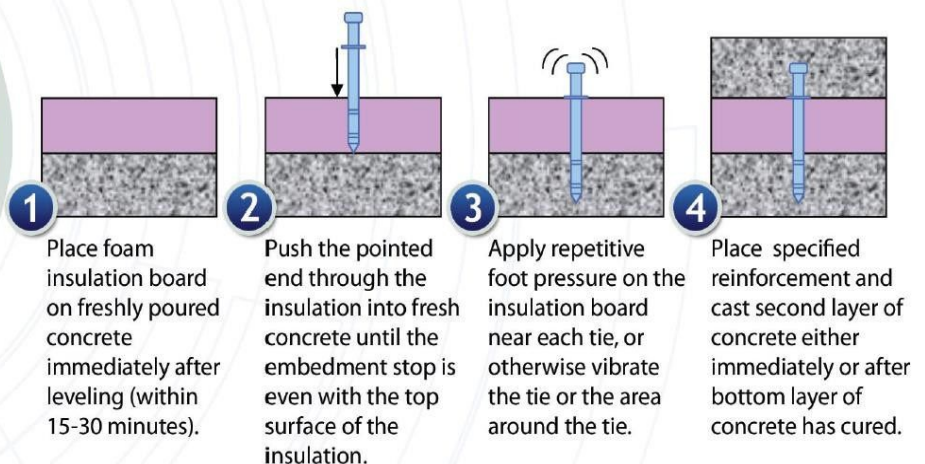
In addition, since the Foamular Insulation is “sandwiched” between two layers of concrete, the panel maintains hard durable concrete surfaces, both inside and out.

Sandwich Panel Connecting Systems

Standard Low-Conductivity Wall Tie



- Holds a face wythe of concrete affixed to the panel without the need for thermally inefficient metal connectors or solid concrete sections
- High strength and low thermal conductivity
- Plastic: high-performance, alkaline resistant, engineered thermoplastic
- In-place temperature range: -40°F to 200°F



Thermal Performance of Insulated Panels

Concrete on its own has virtually no insulation value (1mtr thick concrete = R0.8) compared to 50mm of Foamular XPS at R1.78!

The following example is an indicative 'R' Value of components of a sandwich panel using 50mm Foamular Metric XPS Insulation.

Item	
External Air Film	R'0.03
Fascia Whyte 60mm	R' 0.04
Foamular Metric XPS 50mm	R' 1.78
Structure Whyte 140mm	R'0.09
Internal Air Film	R' 0.12
Total 'R' Value @ 24°C	R' 2.06

Thermal mass benefit

- From mid-2012 HK ties have used a new rating tool that allows the thermal mass effect benefit to be converted to an additional R Value.
- Applied to the example above, the total R value (Based on site location) would increase to approx R3.0
- The Australian Concrete and precast association will have a similar rating tool available early 2013.

The Insulation – Foamular Metric Extruded Polystyrene Insulation

Foamular Metric XPS is a closed cell rigid insulation board with high compressive strength, and moisture resistance. This results in guaranteed long term thermal performance.

Compared to expanded polystyrene, Foamular Metric XPS has higher 'R' value per thickness (50mm = R1.78, EPS 50mm = R1.43) and superior water resistance. (moisture absorption reduces thermal values).

Foamular Metric XPS will not absorb moisture from the concrete thus ensuring thermal values are maintained. Foamular Metric XPS is guaranteed to maintain its physical properties and minimum 90% thermal value for 20 years.

HK Connector Ties

- HK Connector Ties are specifically designed for use in insulated concrete wall sandwich panels.
- HK Ties - Low conductive thermoplastic resin pin.
- Manufactured from a high performance, engineered thermoplastic resin, HK Ties feature high strength and low thermal conductivity.
- Unlike other sandwich panel designs which rely on metal or solid concrete connections, the use of HK Ties minimises the effect of thermal bridging and results in a sandwich panel with maximum thermal performance.
- The HK Ties are designed for quick and accurate installation.
- The tensile strength of each HK Connector exceeds the 1100lb - 498kg minimum performance level, which provides a safety factor of 10: 1
- Pullout test results confirm the HK Tie has a high safety factor of approximately 10 during stripping and lifting of panel.

Installation Instructions

Description

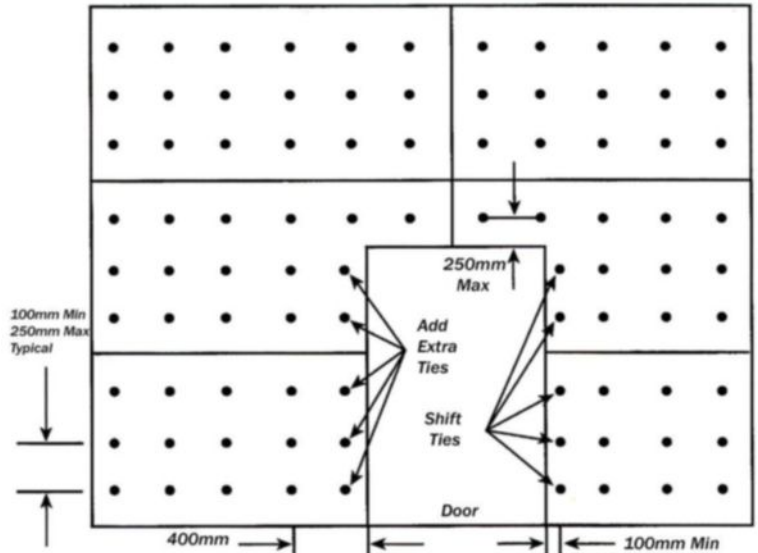
Foamular Extruded Polystyrene (XPS) rigid insulation and *ties are specifically designed for use in tilt-up, site cast and precast panels. Foamular XPS rigid insulation and ties provide a fast, efficient method of insulating walls without compromising the low-maintenance, high durability of concrete walls.

The ties are designed to keep a 75mm fascia layer of concrete affixed to the panel without the benefit of solid sections of concrete.

Applications

The Foamular Metric XPS foam insulation and ties may be used in most tilt-up and precast applications where;

- The fascia, or outside layer of concrete is three inches thick or less.



The panels do not exceed beyond 12mtr above grade.

- The full thickness of the panel, including the fascia is supported.
- The concrete strength at the time of lifting is at least 2,500 psi (17.2 MPa)

Installation

- Place foam insulation board on freshly poured concrete immediately after screeding (within 15 to 30 minutes). The concrete should be level enough to contact the entire surface of the insulation board.
- Insert the ties immediately after placing the insulation board on the wet concrete. Push the pointed end of the tie through the insulation board into the fresh concrete until the embedment stop is even with the top surface of the insulation board. Do not push tie into foam board past embedment stop. Place ties on 400mm centres.
- Promote consolidation of the concrete around the tip of the tie by applying repetitive foot pressure on the insulation ("walking" the board) near each tie, or otherwise vibrating the tie or the area around the tie.

Around Openings

Openings in the wall (eg. for windows) often interfere with the dot pattern printed on the foam. Ties should be no closer than 100mm and no further than 250mm from the edge of the foam. In these cases, you may need to either shift ties away from the openings or add extra ties so this spacing is maintained.

Top or Bottom of Wall

As a result of fabrication, the dots on the board may not reflect proper placement of the ties at the top or bottom of the wall. If the foam has been cut in such a way that the top or bottom row of dots is either closer than 100mm or further than 250mm from the edge, you may need to shift ties away from the edge or add an extra row of ties to maintain proper spacing.

Between Openings

If the insulated wall has two or more openings, or an opening is too close to the panel edge, be sure that the space between them has a least two rows of ties. If necessary, modify the tie spacing so no row is closer than 100mm from the edge of the foam. Extra ties are shipped with each order to facilitate proper spacing. Moving or adding a row of ties is easy with Foamular Metric XPS insulation and ties since the sharp end of the tie will penetrate the foam wherever you need to place it.

Case Studies

Cessnock Corrective Centre

Foamular 40mm insulation and HK ties were used in 4,000m² of precast Walls. Walls were manufactured and erected by Hunter Precast. Tomago NSW.

Westrac Maintenance and Sales Facility Williamstown NSW

Foamular 50mm Insulation was the insulation component for approx. 2500m² of precast panel manufactured and erected by CIA precast Tomago NSW.

Zammit Smallgoods Pendle Hill NSW.

Foamular 75mm insulation and HK Ties were used in 2,600m² of tilt up insulated panels for a new food processing plant, Construction by QTC.

Please Note:

Information in this brochure is an overview of the Owens Corning Pink Core System tested and distributed through Owens Corning America.

In Australia Austech External Building Products Pty Ltd is the National Distributor for Owens Corning Foamular Metric Extruded Polystyrene Insulation.

The Pink Core Ties are manufactured by HK ties USA.

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