



Uni-TWS[®] Thermal Wall System

Unitex[®]

BUILD YOUR DREAM

Uni-TWS The complete Thermal Wall System.

Uni-TWS™ is used in the construction industry to insulate, protect and decorate the exterior of a building structure with the most technologically advanced methods of insulating. Regardless of its age or wall composition, almost any type of building can be insulated without losing any interior floor space. Uni-TWS is lightweight and water vapour permeable to prevent condensation problems. In addition it is highly energy efficient and provides a virtual maintenance free exterior. Uni-TWS has been thoroughly tested by the CSIRO, and its suitability as an insulating and weatherproofing system has been confirmed in CSIRO Appraisals Technical Assessment #310. The specifications for Uni-TWS components and construction are given in the Uni-TWS Manual. This 20 page booklet includes detailed construction drawings.



Why you should choose Uni-TWS wall insulation system

The increase of prices within the last years for energy has highlighted building systems aimed at reducing this increase to all energy consumers. Some answers have proved of low economic value, but the Uni-TWS wall insulation system has shown more and more that it is the most effective solution.

Warmth (energy) permeates through walls, doors and windows. Energy is lost and artificial heating or cooling has to be produced again and again to keep an ambient temperature inside a building.

The energy savings over time mean that the extra costs for application are normally repaid within a few years with lower heating and cooling costs.

What makes up Uni-TWS?

An extensive choice of Uni-shape® Profiles, Uni-Décor finishes and Tuscan finishes with over 250 colours provide for a variety of surface combinations. These as well as sealants, mechanical fastening systems and several protecting and reinforcing systems allow for multiple design possibilities. A rapid lock-up stage with Uni-TWS can be achieved by the builders' own unskilled or skilled labour force, using the patented Uni-TWS edge components. (External bricklayers/contractors etc are not required).

The design of new buildings that provide the benefits of good thermal performance can also provide reduced initial building and equipment costs, as well as lower annual operating costs, while providing a high standard of interior comfort.

For your confidence Uni-TWS has been thoroughly evaluated by the CSIRO. Their test results (summarised on the back cover) combined with use of the Uni-TWS Manual confirms the suitability of Uni-TWS as a high quality insulation and weatherproofing system. Furthermore Uni-TWS has been used in Australia since 1983 with excellent results. The first projects in Victoria at that time were for State Government projects in both residential housing and commercial office construction. Unitex are proud of having over two decades of proven Uni-TWS projects without any guarantee claims or faults.

Household savings

Uni-TWS is permanent, an important consideration in design. Its efficiency permits lower initial investment in heating and cooling plant, as well as savings in operating costs. Uni-TWS lightweight permits lighter, thicker (for depth to openings and even greater insulation) or thinner overall wall construction thus increasing useable floor space.

Minimal thermal stress movement

Exterior insulation also protects the building frame from some of the structural movement caused by temperature changes. Cracks in the back up wall caused by thermal shock are less likely to be shown in the Unitex fibre reinforced Uni-TWS high build, lightweight coating system. Such strains can be partially absorbed by the insulation especially above 50mm thickness.

Due to the variability of substrates/frames/foundations, expansion joints every 6-8 metres (minimum) are essential - in line with standard building practice.

Structural movement joints must be allowed for at design/engineering stage and are always to be nominated by the builder on the provided contractual drawing.

Comfort all year round

- Affordable for the home buyers wanting exterior decorative and coloured render
- Efficient and superior insulation
- Reinforced render of high build strength and long life
- Uni-TWS is designed so that the insulation is placed on the exterior of the building, equalising the effects of outside temperatures and reducing thermal stresses and strains in the structure. Cold spots and drafts are eliminated because the entire surface is insulated. Insulated in summer against heat from the outside and in winter against cold from the outside, Uni-TWS gives you true living comfort all year round.
- The unique Unitex high build, lightweight HiFibre Render system and patented pre-fabricated edge and corner reveals has made this system attractive to specifiers, designers, developers, builders and most importantly the home owner.

Unitex permanent, maintenance free surface

See the Unitex Product Data Sheets

- Uni-Fibro Render
- Uni-Mesh
- HiLite Render
- HiFibre Render
- Uni-Trowel, Roll Décor
- Uni-Marble Grain
- Uni-Edge/Sill Reveals
- Uni-Corner Reveals

The Uni Trowel-Décor decorative surface applied finish has a high bond strength and will not crack or peel in normal conditions. Tests and field experience have proved the system to be water-resistant providing that flashing and wall opening details are properly designed. Refer to construction details for proper application.

Diagram 4*
Detail of Edge Reveal at floor level.

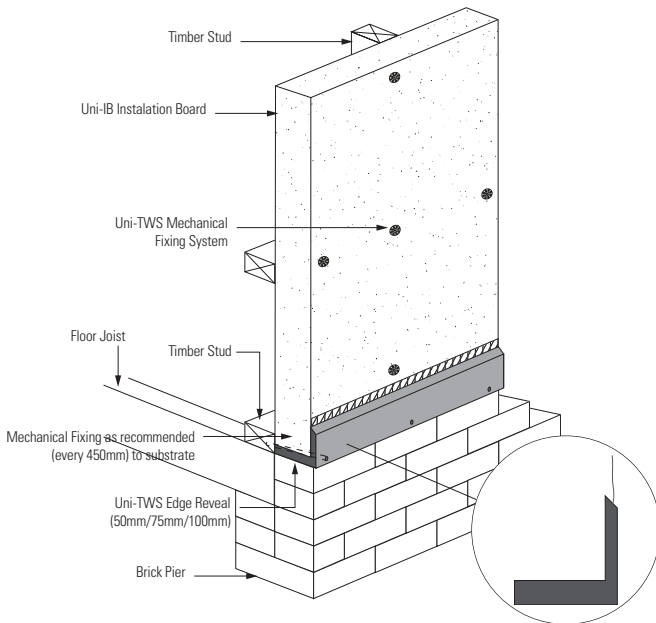


Diagram 5*
Timber/Steel Frame Construction + Bracing Sheet (above 100mm)

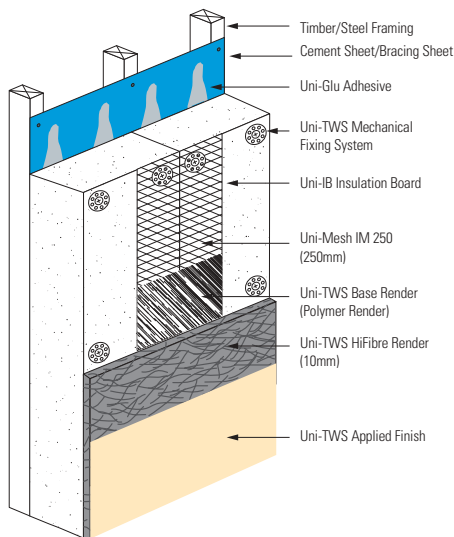
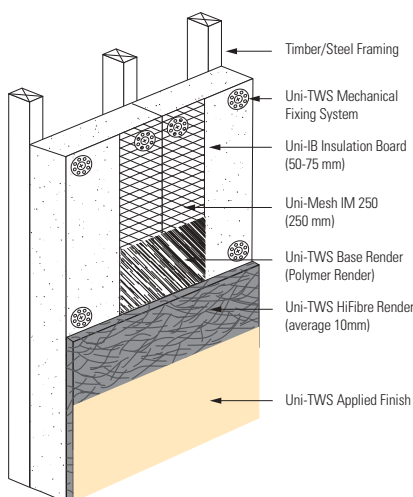


Diagram 6*
Timber/Steel Frame Construction



Protective components of Uni-TWS

Uni-TWS IB Insulation Board (see Uni-TWS Manual)

A rigid panel (generally 1.2m x 2.4m) of cellular polystyrene. The thickness of the board will vary with the thermal insulation required but generally 50, 75 or 100mm.

Uni-Mesh IM 250 A specially woven reinforcing fabric which is treated for compatibility with Uni-TWS mineral based and acrylic cement modified materials. The woven mesh fabric is embedded in the Polymer Render base preparation coating to prevent surface cracking - apply to Polystyrene sheet joints, then overcoat with HiFibre Render.

Uni-Glu Adhesive A unique Polymer material mixed with Portland Cements, is used to fix the insulation board to the cement sheeting or masonry substrate, together with mechanical fixings.

Uni-TWS Mechanical Fixing System Specially made and treated anchors including Uni-Disk available from Unitex must be used for various types of substrates (Timber, Cement Sheeting, Steel Frame, and Masonry) and various thickness of Unitex Insulating Board.

Uni-TWS HiFibre Render Unique to Unitex, this lightweight insulating Render which allows for a high build coating 10 mm minimum depth. The cross-linked, mass fibre reinforcing of the HiFibre Render provides for a high impact surface (safe to handle man-made fibres in slurry).

Uni-TWS Applied Finish We provide a range of Unitex mineral based or acrylic based rollable, trowelable, sprayable or paintable high build and low build coatings. A wide selection of colours and textures are available within the general Unitex Uni Décor coating range.

Uni-shape Facade Profiles Uni-shape Profiles by Unitex are the preferred choice of quality designers and builders throughout Australia for facade enhancement. A range of Uni-shape Facade Profiles are available to suit any style - from traditional to the most modern buildings.

Uni-TWS Window Reveal® Trims (patented)

The patented Unitex Window Reveal system (i.e. the combination of edge and sill reveal trim system) has been designed to solidly protect and enhance all wall openings. Similarly the Unitex plinth protection trims are designed for strength, stringline straightness/exactness to lower edgings and decorative effects (see Diagrams 1 & 2).

Uni-TWS Quoining Panels are also now commonly used for external corner protection and traditional enhancement (see Diagram 1).

Specifiers & Builders should visit our web-site for more technical information. Individual components of the system are available as downloadable documents at: www.unitex.com.au

Timber/Steel frame - with bracing sheet

Unitex recommend bracing (backing) sheet when the Uni-Insulation Board is over 100mm thick. Builders can elect not to back with bracing sheet if they know they have an adequately braced structure. Highly recommended over steel stud frame.

A thinner way to beat the heat

Each building material has its own specific co-efficient of thermodynamic conductivity. The thermodynamic conductivity (W/m.K) tells us about the rate of warmth that permeates a certain material under defined conditions. This coefficient is an important figure for the calculation of heat retention values. Uni-TWS has an R-value of 1.824 for the 75 mm foam base system. When combined with the other elements of a normal wall – timber frame providing the air cavity, plasterboard, and air movement on both the inside and outside surfaces – the total R-value is approx. 2.17. If an insulating reflective foil is installed in the air cavity, the R-value rises to approx. 2.62.

Easy to apply and on the eye

Uni-TWS is a proven method of insulating buildings on the exterior, and is suitable for new construction and renovation work. It is cost effective, lightweight, easy to apply and aesthetically pleasing. It provides good insulation with a maintenance-free surface.

Substrates

Virtually any surface will accept Uni-TWS including concrete (cast in place or precast), metal framed, masonry substrate, single or multi-storey timber frame with or without exterior FRC sheet.

On all structures expansion joints are required to allow for expansion and contraction of the substrate. Generally this will mean expansion joints every 6-8 metres in the vertical plane and between each floor in the horizontal plane.

Types of Construction

Uni-TWS offers versatility and architectural freedom. It may be used on the entire wall, or can be used as accent panels by itself or in combination with other materials such as Uni-Shape moulded lightweight profiles, Unitex Architectural Columns, Unitex Quoining and suitable 3-D projections. In addition to normal facade work, the finish can also be used for fascia window wall, and prefabricated modular wall elements.

Turning the old house into a home

Uni-TWS is a practical solution to insulating and cladding problems of existing buildings. It offers all of the advantages as for new construction, and can be done without disturbing the interior of the building. As well, savings in heating and cooling costs will be realised.

Living in the ideal climate

A satisfactory indoor climate has surprisingly limited characteristics. An air temperature variation of about 3°C is all we need normally accept. Relative humidity may vary between 25% and 60%. Lower or higher variations are generally objectionable. The movement of air within the building should not be more than 1 metre per minute. At higher velocities, the occupants feel drafts, particularly if the air is cool. In addition to these conditions, the dry bulb air temperature is in the comfort zone.

These conditions should be maintained during the annual extreme outside air temperature changes and for this purpose the building structure should be used as a regulator to store generated heating or cooling.

Uni-TWS can aid in the elimination of internal water vapour condensation on cold inside surfaces, particularly in the case of precast panel walls.



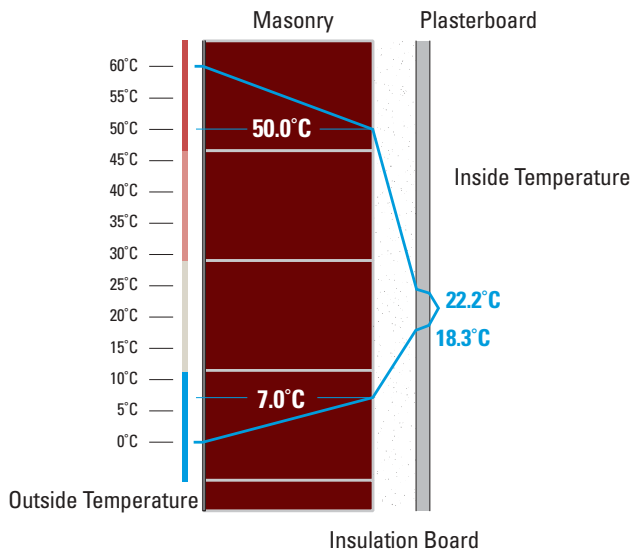


Diagram 7* (approximate only)
Thermal Transfer Masonry Construction

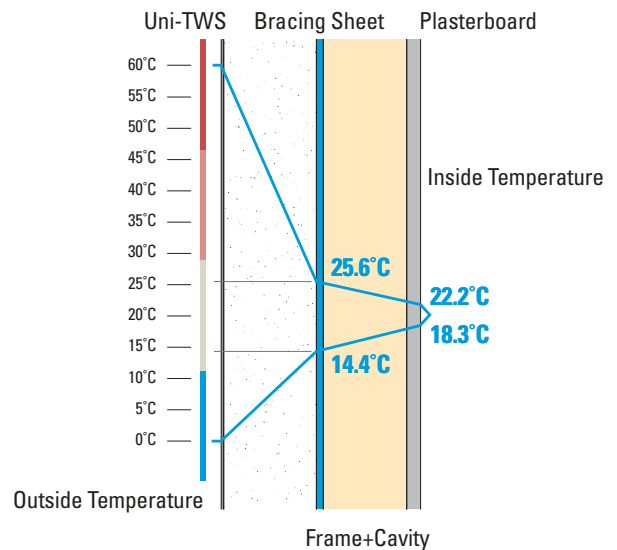


Diagram 8* (approximate only)
Thermal Transfer Timber/Steel Frame Construction

Comfort starts outside the home

In conventional buildings comfortable interior temperatures can be achieved by using the insulation on the outside of the structure and using the structure as storage medium for excess heat and cold. The stored heat/cold not only reduces the rate of temperature changes indoors, but also tends to reduce the peak demands for heating or cooling. Diagram 7 illustrates a 203.7mm masonry wall with an outside applied finish and 50.8mm of insulation on the inside with 12.7mm of plaster interior finish.

It can be seen that with the insulation on the inside wall the exterior face of the concrete/applied finish block has a temperature change between summer and winter of about 59.5°C which generates considerable thermal stresses in the structure. In winter, no useable heat is stored in the wall and will add to the peak demand for heating or in summer cooling.

When the insulation is used on the outside of the building as illustrated in Diagram 8, the temperature changes are reduced. Under the same conditions as Diagram 7, the temperature changes in the structure are reduced to only

11.2°C and therefore reduces the stresses within the structure. Heat is stored in the wall and it will tend to decrease the rate of temperature changes on the inside of the wall, which is required for greater comfort.

The Uni-TWS wall insulating system is designed to meet the comfort requirements within the building and is an effective tool in thermal design.

Uni-TWS is not a material but a system consisting of an insulating layer of Uni-TWS Insulation Board - a rigid polystyrene used on the outside of any conventional building, Window Reveal plus Plinths and a reinforced multi-layer exterior of a special polymer finish which can be textured to many patterns, designs and colours. Included in the exterior finishes are Uni-Decór Roll, Uni-Decór Trowel, Uni-Marble and Uni-London Fog finishes.

When a building is insulated with Uni-TWS, the thermal stresses in the structure may be limited to a predetermined maximum. It has practically unlimited possibilities to meet any yard-stick of the thermal, comfort or economical performance.





No special structure design is required to take Uni-TWS because of the lightweight panels. As well, significant benefits in occupant comfort, minimal maintenance and lower initial and operating costs in heating/cooling equipment can be realised.

In addition to new construction, Uni-TWS is well suited to renovation of existing buildings to provide adequate insulation and a permanent, maintenance-free high impact, coloured exterior render surface.

Uni-TWS used with the Uni-shape range can create beautiful historical era refurbishments.

The finish you expect



Specifiers & builders should visit our web-site for technical information:

Detailed technical information on individual components of the system are available as downloadable documents:

www.unitex.com.au

Specifier's Clause:

Refer to the Uni-TWS Manual (p.19) or visit: www.unitex.com.au

The information contained in this document is based on data available at the time of writing, which we believe is accurate and reliable. Unitex reserves the right to change the information without prior notice.

Total Wall Insulation

Based on the CSIRO test, Uni-TWS is estimated to have a 'total-wall' R-value = 2.17. (see page 6 for details).

CSIRO Test Results

Refer also to CSIRO Appraisals Technical Assessment #310

- **Fire Resistance** (AS1530.3):
Ignitability Index = 0 Spread of flame Index = 0
Heat evolved Index = 0 Smoke Developed Index = 2
- **Waterproofing** (ASTM E514): No transmission of water even after 4 hours, of continuous shower simulation.
- **Strength** (AS/NZ 2208.1): No damage from soft-body impact at impact energy of 45 joules

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