

TRADIS[®]

Insulated Structures

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CI/SfB (2-) X (M2)

February 2006



- Rapid build
- Accurate and consistent
- Warmcel 500 insulated
- Healthy internal environment
- Sustainable and energy saving
- Automatic room-in-the-roof
- Industry acclaimed

Factory-produced wall panels, floor cassettes and roof plates – delivering a new dimension in time and space

More Space, Less Time

TRADIS is a range of factory-produced structural wall panels, floor cassettes and roof plates that enables a complete house shell to be constructed in less than a day.

Warm and Healthy

Highly insulated and designed using EVT Technology principles, TRADIS delivers a warm, healthy living environment that is free from harmful emissions and has an inherent ability to deal with any moisture or water vapour that enters the structure, thereby guaranteeing its integrity.

Extra Living Space

A roof constructed from TRADIS automatically produces a 'room-in-the-roof' feature, without further work or adaptation, producing extra useable living space for the same size house footprint.



Total Solution

And when utilised for the complete construction of a building, TRADIS provides a totally insulated building envelope, combining the benefits of rapid erection for the builder with a healthy, energy efficient environment for the inhabitants.

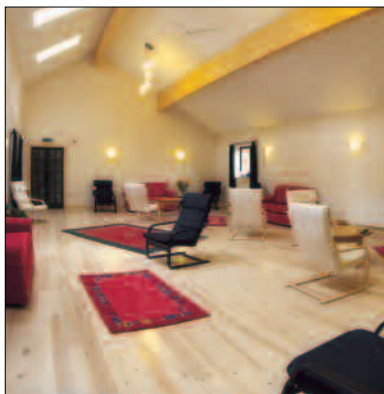
Sustainable

All of the components of TRADIS are manufactured from recycled or sustainable materials, satisfying the criteria for sustainable housing. Houses built in TRADIS use up to 40% less material than traditional timber frame structures.

Living with TRADIS®

Energy Efficient

Delivering U values of between 0.22 and 0.09 W/m²K (far superior to building regulations' requirements), TRADIS enables heating systems to be downsized and heating costs themselves to be dramatically reduced.



Typical TRADIS family houses cost a maximum of £1 - £2 per week to heat and, in many cases, central heating is not needed at all.

Designed for Healthy Living

TRADIS utilises EVT Technology to ensure that any moisture that enters the structure (water vapour is naturally generated in a building from cooking, washing and occupants' perspiration) can safely migrate to the outside, thereby helping to create a more healthy living environment. The reduction in space heating requirement made possible by TRADIS also greatly reduces the amount of harmful CO₂ generated in a home.

The healthy living environment is further enhanced by the properties of the individual components that are used to construct TRADIS, which have been selected to be free from CFCs, volatile organic compounds (VOCs) or other toxic substances and produce virtually no formaldehyde emissions.

Fire Protection

TRADIS structures are extremely resistant to fire, offering reassuring peace of mind to house buyers and tenants alike.

In an official fire test conducted by Chiltern International on a loadbearing panel, the panel withstood over 70 minutes of sustained exposure to temperatures of up to 1000°C, exceeding the standard building regulations requirement by over 40 minutes.

Throughout the test the external face of the panel remained at a cool 17°C.

Warmcel 500-insulated TRADIS panels, manufactured using appropriate Excel-approved fire resistant sheathing, are accredited by the Loss Prevention Certification Board (LPCB)* in relation to fire resistance. These versions of TRADIS are listed in the LPCB 'Red Book', the board's official list of approved fire and security products and services. The Red Book is the authoritative guide to those companies whose operations, products and services achieve compliance with the quality assurance, product approval and certification schemes operated by the LPCB.

Sound Insulation

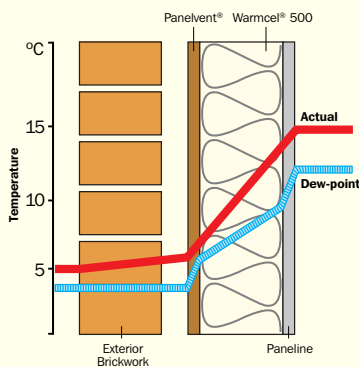
The sound absorption properties of TRADIS provide an effective solution to noise pollution, particularly important in applications where airborne sound can cause a problem for people living or working in adjacent rooms.

*Part of BRE Certification, the LPCB is an internationally recognised certification body responsible for the independent accreditation of fire and security products and services to the standards laid down by the certification authority.



EVT Technology

'EVT Technology' describes the fundamental principles on which all TRADIS insulated structures are based. 'EVT Technology' refers to a very specific combination of component materials that delivers very high levels of insulation and has the ability to allow any water vapour that has entered the structure to harmlessly migrate to the external atmosphere.



Diffusion is maximised in a controlled way to promote the passage of water vapour through the structure; an effect known as Enhanced Vapour Transfer or EVT.

This capability avoids any risk of interstitial condensation, thereby protecting the integrity of the structure.

EVT performance relies on the effective harmonisation of TRADIS's component materials in a homogenous structure. Both the components and their combined performance have been exhaustively and continually tested for many years to ensure TRADIS structures offer the perfect balance of vapour resistivity and permeability to achieve reliable EVT performance.

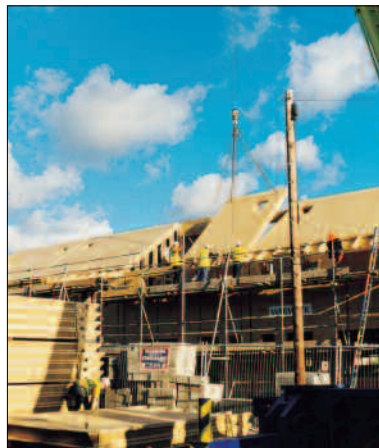
'EVT Technology' was developed by Excel in the UK following extensive trials and many years' 'whole house' testing to deliver dependable in-use performance.

Building with TRADIS®

Based on Excel's well-proven closed panel EVT Technology solution, TRADIS combines all the performance benefits offered by the closed panel system, with the erection benefits of a factory engineered product, including dimensional accuracy, consistency and quality controlled compatibility.

Simple and Rapid On-Site Erection

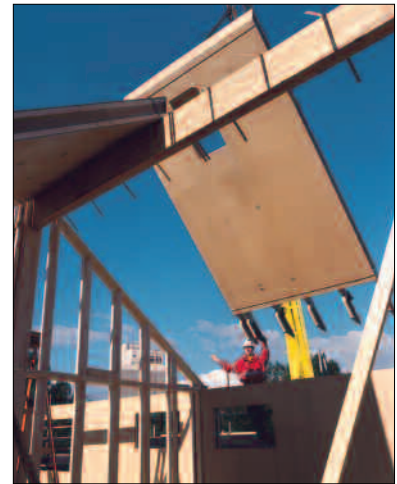
TRADIS wall panels, floor cassettes and roof plates are delivered to site by lorry on the day of erection. Each section is lifted into place by crane and simply manoeuvred and nailed in position by an erection team of only three people.



Using this method, a typical pair of semi-detached house shells can be fully erected so they are wind and water-tight in a single working day, enabling following trades to start immediately.

Large, Clear Spans

Because of the light weight and dimensionally stable components used to create TRADIS, wall panels, floor cassettes and roof plates can be produced up to 12m long x 3.1m high and up to 400mm deep. The ability to create large, clear spans offers reduced foundation costs and greater flexibility for internal layouts.



This is particularly important, for example, in planning lifetime homes, which may need to be reconfigured to meet the changing lifestyle needs of their occupants.

Designed-in Benefits

Design features of TRADIS offer further on-site advantages. For example, wall panels can be supplied with doorframes and fully glazed windows already in place, so that once erected, the building interior is immediately weather protected.

An in-built service zone on the interior side of each panel facilitates the rapid installation of following services, allowing finishing times to be dramatically reduced without disturbing the integrity of the panel. Roof plates can be pre-battened, ready for the installation of tiles, slates or other roof covering.



Lowering the Cost

The installed cost of TRADIS is comparable with the cost of constructing a traditional timber frame structure and insulating it on site.



from the sale of property or from rent, for example in the social housing sector, is realised much more quickly, making further commercial sense.



overall build programme. While the reduced need for space heating enables smaller heating systems to be used, offering a major saving in capital costs.

Arguably the most impressive added value offered by TRADIS is the automatic creation of a room-in-the-roof, producing additional living space for the same size house footprint and without adding to the cost of the structure.

The Truly Cost-effective Option

When all of the building programme costs, including hidden costs, and the added value provided by TRADIS are taken into account, the TRADIS solution will almost always work out to be the best value option.

However, the speed of erection, consistency of manufacture and reduction in required labour deliver guaranteed higher levels of build quality, significant reductions in build time (bad weather, shortage of labour during busy periods have far less adverse effect) and an overall, more reliable method of construction.

Delivering More Value

TRADIS also offers a number of indirect cost benefits, such as a reduction in foundation costs and the ability to easily and cost effectively rearrange internal layouts, facilitated by the large, structural spans that can be produced.

The ease and speed with which following services can be installed, accommodated by the in-built service zone, further lessens the cost of the

Modern Methods of Construction

Embodying the principles of Modern Methods of Construction (MMC) and addressing the Government's objective of less wasteful, more energy efficient build processes and technology, TRADIS epitomises the advantages of offsite manufacture.

Commercial Sense

Because build times with TRADIS are dramatically reduced, the income

TRADIS® U-value guide

TRADIS U Value Calculations. Combined method of calculation effective from April 2002.

Wall Panels

Wall Construction Profile	Panel Depth	'U' Value W/m ² K	'U' Value W/m ² K (Combined method)
Brick Skin 102.5mm Ventilated Cavity 50mm Panelvent 9.2mm Composite 'I' beam studs / Warmcel 500 to depth indicated Paneline 6.4mm Service Void 25mm Standard Plasterboard 12.5mm 2 coats Gyproc Drywall Sealer	150mm TRADIS®	0.20	0.199
	170mm TRADIS®	0.18	0.179
	200mm TRADIS®	0.16	0.156
	220mm TRADIS®	0.15	0.144
	240mm TRADIS®	0.14	0.134
	250mm TRADIS®	0.13	0.129
	300mm TRADIS®	0.11	0.110
	350mm TRADIS®	0.10	0.096
	400mm TRADIS®	0.09	0.085

Roof Plates

Roof Construction Profile	Panel Depth	'U' Value W/m ² K	'U' Value W/m ² K (Combined method)
Slate 5mm Ventilated Cavity 50mm Tyvek HD Plus membrane Panelvent 9.2mm Composite 'I' beams / Warmcel 500 to depth indicated Paneline 6.4mm Service Void 25mm Standard Plasterboard 12.5mm 2 coats Gyproc Drywall Sealer	200mm TRADIS®	0.16	0.16
	220mm TRADIS®	0.15	0.15
	240mm TRADIS®	0.14	0.14
	250mm TRADIS®	0.13	0.13
	300mm TRADIS®	0.11	0.11
	350mm TRADIS®	0.10	0.10
	400mm TRADIS®	0.09	0.09

TRADIS® Components

Warmcel® 500

Warmcel 500 Insulation provides the heart of TRADIS's EVT Technology Solution. In addition to its outstanding thermal performance (an impressive thermal conductivity value (k) of 0.036 W/mK), it benefits from excellent hygroscopic properties, which promotes the migration of water vapour from the wall panel, floor cassette or roof plate. Furthermore, its hygroscopic capability enables it to absorb surplus water vapour at times of high internal humidity and release it when conditions allow. Warmcel 500 is the only BBA-certified insulation material with this capability.

Manufactured from 100% recycled waste newspaper, Warmcel 500 has extremely low embodied energy, requiring less energy to produce than any other mainstream insulation material.

COMPOSITE 'I' Beams

The structure of TRADIS wall panels, floor cassettes and roof plates is precisely factory-manufactured from composite 'I' beams, offering an extremely strong, rigid frame that is, at the same time, light and easily manoeuvrable. The 'I' beams enable the Warmcel 500 to interlock with each element of the frame, thereby maximising the integrity of the insulated structure. The beams are themselves designed for minimal cold bridging, featuring only a thin section web between flanges of sustainable timber.

Panelvent® Sheathing

Panelvent provides the external sheathing of TRADIS wall panels and floor cassettes. It features high racking strength and exhibits excellent weather resistance to ensure a building structure created from TRADIS is immediately wind and watertight.

Sarket

On a TRADIS roof plate, Sarket can be used as the external sheathing. Manufactured from sustainable materials, Sarket provides the combined benefits of racking strength, added insulation and weather protection. This profiled, interlocking board accommodates mid-span joints to minimise waste, while ensuring the finished EVT Roof is also wind and watertight.

Paneline

Paneline sheathing board is recommended as the internal sheathing on TRADIS. Manufactured using similar materials and processes to Panelvent, Paneline's formulation has been developed to provide the required vapour resistance to control the migration of water vapour from the structure to the external atmosphere.

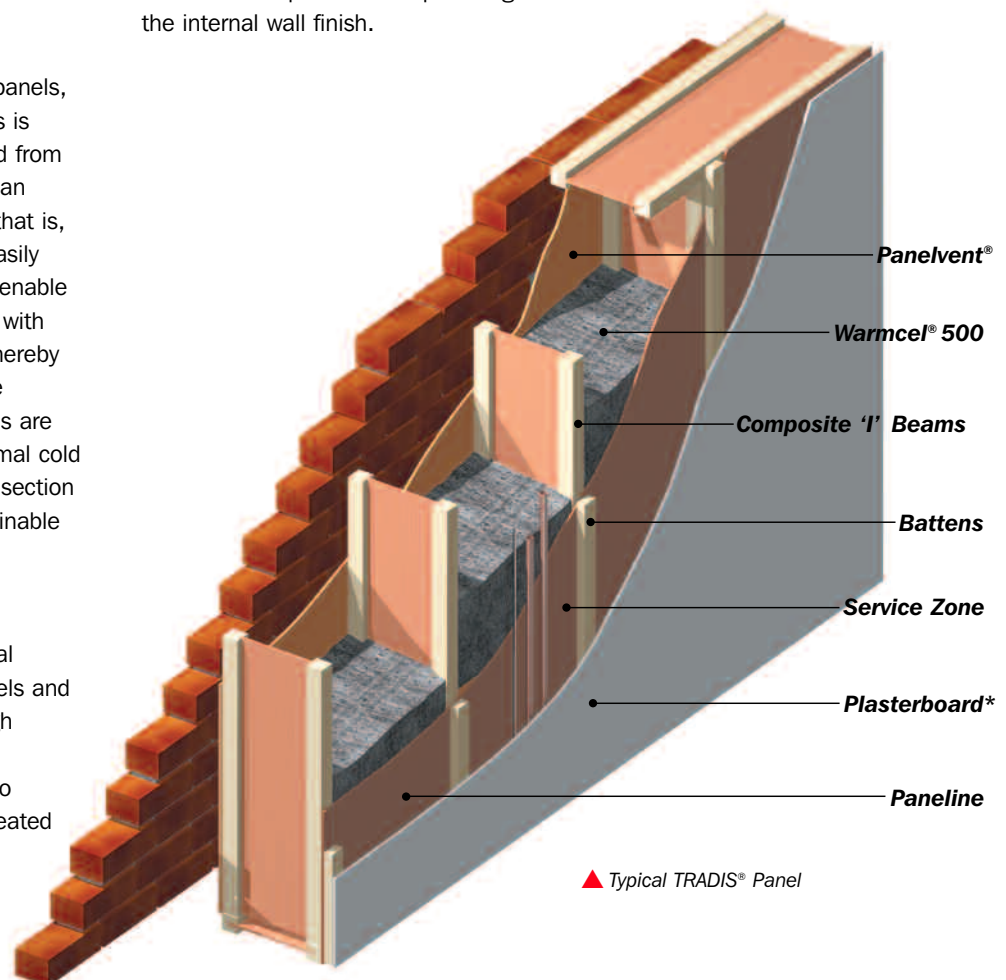
Service Zone

25 mm battens are used to create the service zone on the internal face, with standard plasterboard providing the internal wall finish.

TurboFill Dry Injection System

TRADIS panels are insulated with Warmcel 500 insulation using the TurboFill injection system. The Warmcel is blown through a nozzle that is similar in appearance to those used on Grand Prix refuelling rigs. The nozzle is docked with the panel by means of pre-drilled access holes, through which the Warmcel 500 is injected.

The TurboFill system manages the even distribution of Warmcel 500 throughout the panel void. An ingenious pressure sensing system ensures the void is completely filled to the correct density for optimum performance and to avoid settlement.



* Fitted on site after services installed

TRADIS® – Fast Track Benefits

Rapid erection

Thoughtful design and construction details enable three men and a crane to erect a pair of semi-detached houses in just one working day – benefiting build programmes and reducing the pressure of skills shortages.

Room-in-the-Roof

Structural strength removes the need for cross ties and struts used in conventional roofs, producing a room-in-the-roof feature as standard – no extra cost.

Thermal efficiency

U values of 0.22 W/m²K to 0.10 W/m²K (depending on depth of section), resulting in greatly reduced heating systems and, therefore, reduced CO₂ emissions and reduced costs – typical social housing fabrics cost around £1 to £2 per week to heat. U values greatly exceed building regulations requirements.

EVT Technology

TRADIS ensures that any water vapour that gets into the structure can safely migrate to the external atmosphere (water vapour being naturally generated in all buildings), thereby protecting the integrity of the structure.

Long spans

The light weight of TRADIS structures enables large, clear spans to be constructed, giving greater flexibility of internal layouts and reduced foundation costs. Floor cassettes facilitate the rapid installation of ground floors with reduced ground disturbance.

Controlled manufacture

Ensures all wall panels, floor cassettes and roof plates delivered on site are built to the same high standards - straight edges, perfect angles, accurate finish.

Service void

Provision for fast and simple on-site installation of services, while ensuring the integrity of the TRADIS panel is maintained.

Minimal environmental impact

Utilising materials selected for their environmental credentials, TRADIS minimises impact on the environment.

Less raw material

Up to 40% less material than traditional timber frame.

BBA approved

The main components of TRADIS are BBA approved.



Accolades & Endorsements

TRADIS has amassed a worthy collection of accolades and endorsements from some of the most influential and knowledgeable institutions and organisations in the UK. These independent assessments of TRADIS's credentials have critically acclaimed the product and building projects in which it has been employed.



Contract Journal

Winner of the Contract Journal *Construction Industry Awards* 'Construction Product Manufacturer of the Year'.

The judges of the award highlighted TRADIS's sustainability, along with high levels of research and development, investment and innovation as key factors behind its success.



Construction News



Winner of the *Quality in Construction Awards – Research & Development (Materials)*, run by Construction News. The award acknowledges TRADIS's ability to deliver increased performance, durability, safety, economy and competitiveness to the UK construction industry.



BUILDING HOMES



Winner of the Building Homes magazine *Innovation Awards*, run by the influential house building publication and backed by Zurich Building Guarantees.



Awarded *Millennium Products* status by the Design Council. This accolade recognises the innovation and creativity behind the TRADIS range and the pioneering step forward it offers the construction and house building industries.



CDS Housing's Harlow Park sustainable housing development in Liverpool, which features houses constructed in TRADIS, was recognised in *The National Housing Awards* in the 'Innovation in Social Housing in the UK' category.



Overall Winner' and winner of the 'Green Category' in the *Plan Expo Awards* held in Dublin.

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Excel Industries Limited reserves the right to amend product specifications without prior notice. The information given in this document is given in good faith and any recommendations for use should be verified as to suitability and compliance with actual requirements, specifications and applicable laws and regulations.

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