

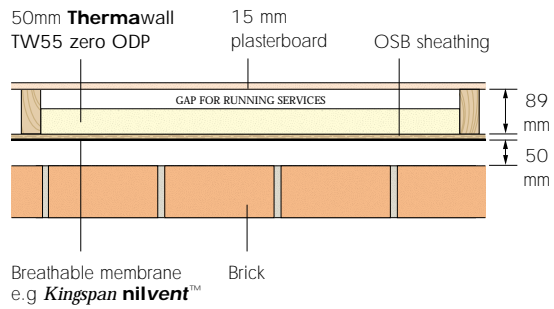
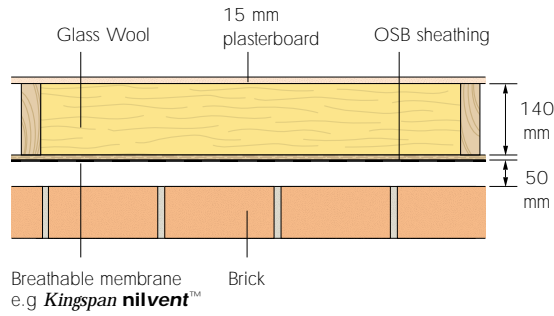


Timber Frame Walls – Rethinking Construction

INSULATION BEST PRACTICE
FOR THE 21ST CENTURY



England & Wales
Edition



SUMMARY

Kingspan Thermawall TW55 zero ODP is a rigid urethane insulation board for timber frame wall applications. Using this product to achieve the requirements of the new Building Regulations could yield a saving of 37% or more over the additional costs of achieving the requirements using a rock wool or glass fibre quilt/batt based solution.

TRADITIONAL PRACTICE

Timber frame walls as traditionally constructed typically comprise 89 mm deep studs filled with 90 mm mineral fibre quilt/batts.

This construction achieved a U-value of $0.41 \text{ W/m}^2\cdot\text{K}^*$ and thus achieves the requirements ($0.45 \text{ W/m}^2\cdot\text{K}$) of the old Building Regulations and Standards in all of the UK and Ireland.

CHANGES TO THE BUILDING REGULATIONS

The new Approved Document L of the Building Regulations (England & Wales) requires a U-value as of $0.35 \text{ W/m}^2\cdot\text{K}$ for walls to comply with the elemental method of compliance.

ASSESSING THE ALTERNATIVES FOR FUTURE PRACTICE

The change in U-value to 0.35 W/m².K for walls provides an opportunity for specifiers to rethink the way they insulate timber frame walls.

In order to achieve a U-value of 0.35 W/m².K, 100/110 mm of mineral fibre quilt/batts of the type currently used may be required*. This would require stud depths to be increased to 100/110 mm to accommodate the insulation. In reality a standard size like 140 nominal would be used.

Mineral fibre in timber frames relies on friction to hold it vertical and so a slight over-thickness is normally used. Therefore, a standard thickness of insulation, say 150 mm, would most likely be used.

However, there is a compelling alternative that specifiers would do well to consider. 50 mm of **Kingspan Thermawall TW55 zero ODP** between 89 mm deep studs will also achieve a U-value of 0.35 W/m².K*.

This alternative clearly requires less timber in your walls offering savings on building cost. **Kingspan Thermawall TW55 zero ODP** is more expensive than mineral fibre quilt, however, an analysis of the cost balance still shows that **Kingspan Thermawall TW55 zero ODP** offers the cheapest overall solution.

COST ANALYSIS OF THE ALTERNATIVES

Consider the house-type opposite. Kingspan Insulation commissioned an independent cost analysis of the alternatives to comply with the new Approved Document L of the Building Regulations (England & Wales).

The base line for the cost analysis was the traditional 0.41 W/m².K* wall using 90 mm deep mineral fibre quilt between 89 mm deep studs.

The two new Regulations cases were 150 mm deep mineral fibre quilt between 140 mm deep studs and 50 mm **Kingspan Thermawall TW55 zero ODP** between 89 mm deep studs.

For the 150 mm deep mineral fibre option the additional cost over and above the base line option for the house type above is £1,192.00.

For the 50 mm deep **Kingspan Thermawall TW55 zero ODP** option the additional cost over and above the base line option for the house type above is £749.32.

The additional cost of the 50 mm **Kingspan Thermawall TW55 zero ODP** option is 37% lower than that for 150 mm deep mineral fibre.

The cost of **Kingspan Thermawall TW55 zero ODP** used in the analysis is for boards supplied in pre-cut widths to suit the stud dimensions and centres which incurs a premium over standard board sizes. The premium price was used in these calculations.

A copy of the calculations in detail are available upon request from the Kingspan Insulation Marketing Department on 01544 387210.

ADDITIONAL BENEFITS OF THE BEST PRACTICE ALTERNATIVE

- There is no need to change your building designs, just the insulation specification. The savings in the cost of design time are obvious.
- You do not need to compromise internal living space or footprint size for 50% additional wall thickness that is a consequence of using mineral fibre quilt/batts.
- No change in transport costs. 140 mm deep studs would increase transport costs by approximately 50%.
- Handling 140 mm deep wall panels on site will incur additional cost because of the additional weight. **Kingspan Thermawall TW55 zero ODP** insulated panels maintain handling costs as they are.



FIRST FLOOR PLAN

Floor areas;

Ground floor = 94 sq.m

First floor = 85 sq.m

Total = 179 sq.m



GROUND FLOOR PLAN



KINGSPAN THERMAWALL TW55

- **Kingspan Thermawall TW55 zero ODP** is a rigid urethane insulation board faced with composite aluminium foil facings on both sides.
- 50 mm of **Kingspan Thermawall TW55 zero ODP** in an 89 mm stud cavity allows 39 mm for service runs etc. without compromising the depth of the insulation layer.
- A standard timber frame wall insulated with 60 mm **Kingspan Thermawall TW55 zero ODP** between 89 x 38 mm studs at 600 mm centres, with a 9 mm OSB sheathing and 12.5 mm plasterboard lining achieves a 1/2 hour fire rating when tested to BS 476: Part 21: 1987.
- The addition of a 12.5 mm fireline board to the inside of the structure gives a timber frame that achieves a 1 hour fire rating when similarly tested.
- The thermal performance of **Kingspan Thermawall TW55 zero ODP** is unaffected by air movement or moisture.
- **Kingspan Thermawall TW55 zero ODP** boards are available pre-cut to suit stud dimensions and centres.
- **Kingspan Thermawall TW55 zero ODP** can be used as an insulated sheathing board for timber framing as well as between timber frame wall studs.
- **Kingspan Thermawall TW55 zero ODP** is manufactured without the use of CFCs/HCFCs and has zero Ozone Depletion Potential.
- Standard construction techniques can be used.
- **Kingspan Thermawall TW55 zero ODP** offers a high-tech and modern solution that is easy to handle and install.
- No gloves or masks are required when installing **Kingspan Thermawall TW55 zero ODP** unlike mineral fibre.
- There is no danger of slumping and sagging of insulation with **Kingspan Thermawall TW55 zero ODP**.
- There is no maximum exposure limit associated with the handling of rigid urethane insulation unlike mineral fibre.
- **Kingspan Thermawall TW55 zero ODP** is manufactured from trade marked **Nilflam**® technology.



THE KINGSPAN THERMA-ENVELOPE SOLUTION

Kingspan Insulation provides a complete range of products for the insulation of timber frame buildings including:

- **Kingspan Thermapitch TP10 zero ODP** – rafter level insulation for tiled or slated pitched roofs; and
- **Kingspan Thermafloor TF70 zero ODP** – insulation for solid concrete and suspended timber and concrete ground floors.

For further information on these products and **Kingspan Thermawall TW55 zero ODP** please contact the Kingspan Insulation Literature Hotline on 01544 387210.

* Assumes that 15% of the wall area is made up of timber bridging insulation.

CUSTOMER SERVICE

For quotations, order placement and details of despatches please contact our Building Fabric Insulation Customer Services Department on the numbers below:

UK	– Telephone:	+44 (0) 870 850 8555
	– Fax:	+44 (0) 870 850 8666
	– email:	commercial.uk@insulation.kingspan.com
Ireland	– Telephone:	+353 (0) 42 97 95000
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TECHNICAL ADVICE

Kingspan Insulation Ltd support all of their products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a free computer-aided service designed to give fast, accurate technical advice. Simply phone our **TECHLINE** with your project specification and we can run calculations to provide U-values, condensation/dew point risk, required insulation thicknesses etc.... Thereafter we can run any number of permutations to help you achieve your desired targets.

We can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

Please contact our Building Fabric Insulation Technical Services Department on the **TECHLINE** numbers below:



UK:	– Telephone:	+44 (0) 870 850 8555
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LITERATURE AND SAMPLES

Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear 'user friendly' advice on typical design; design considerations; thermal properties; sitework and product data.

Available as a complete Design Manual, on CD-ROM or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact our Marketing Department on the numbers below:

UK	– Telephone:	+44 (0) 1544 387 210
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GENERAL ENQUIRIES

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Kingspan Insulation reserve the right to amend product specifications without prior notice. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a free Technical Advisory Service (see left) whose advice should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of the literature is current by contacting our Marketing Department (see above).



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