

The retrofit solution and looking beyond U-values

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Context – why is retrofit important?

Key points to consider:

- The UK is facing an energy crisis. It is estimated that by Spring 2023 a typical family could be paying 500% more for their household energy bills than before the pandemic¹.
- The UK is still committed to a net zero emissions target by 2050. The Built environment accounts for almost 40% of global emissions. In a UK context, 80% of buildings that will be around in 2050 are already built. The ability to reduce emissions from the UK's existing housing stock will be key².
- The UK has some of the oldest and least efficient housing in Europe. Approx. two-thirds of homes (19 million) need better insulation levels³, and of these around 8.5million have difficult to treat solid walls. Currently only 9% of these have wall insulation fitted⁴.

¹ <https://www.theguardian.com/business/2022/sep/05/a-crisis-is-coming-for-uk-energy-prices-and-this-is-what-has-to-be-done>

² <https://www.building.co.uk/focus/countdown-to-zero-how-can-the-uk-meet-its-2050-carbon-targets/5109420.article>

³ <https://www.bbc.co.uk/news/science-environment-60290876>

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/970064/Detailed_Release_-_HEE_stats_18_Mar_2021_FINAL.pdf

What are the options for retrofit?

The latest energy efficiency details issued by the office for national Statistics detail the percentage of UK properties that have had insulation measures already installed.

- 66% of properties (with a loft) have loft insulation already installed
- 70% of properties (with a cavity) have cavity wall insulation already installed
- 9% of properties (with solid walls) have solid wall insulation¹

On this basis, although there is still some potential for lofts and cavities (bearing in mind that cavity insulation has its own issues) there is significant potential for solid wall insulation, either external (EWI) or internal (IWI) insulation systems.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/970064/Detailed_Release_-_HEE_stats_18_Mar_2021_FINAL.pdf

Solid wall insulation – IWI or EWI?

Choosing which system to use for any given project requires an understanding of the existing building itself as well as the requirements of the homeowner.

There are PROS and CONS to both systems.

- External insulation may not be suitable for listed buildings or properties in conservation areas
- Internal insulation may be too restrictive

As IWI systems can generally be undertaken by the homeowner and can address a significant number of property types where the energy crisis is more acute (ie terraced housing, flats) we will concentrate on IWI.

IWI – Pros and Cons

PROS

- Can be installed by the homeowner
- Generally less expensive
- Doesn't impact on the appearance of the property
- More suitable for conservation areas
- Suitable for multi family properties

Cons

- Reduces the size of internal living space
- Disruptive
- Can be more critical when considering condensation risk
- Internal fixing of items becomes more difficult
- Thermal bridges need to be considered

Main drivers for IWI

The main drivers for IWI systems determine the useability and type of system that is used:

Ease of installation

Air quality

Impact on room size

Reducing moisture risks

Thermal performance

Reducing petro chemicals

Payback period

Carbon storage

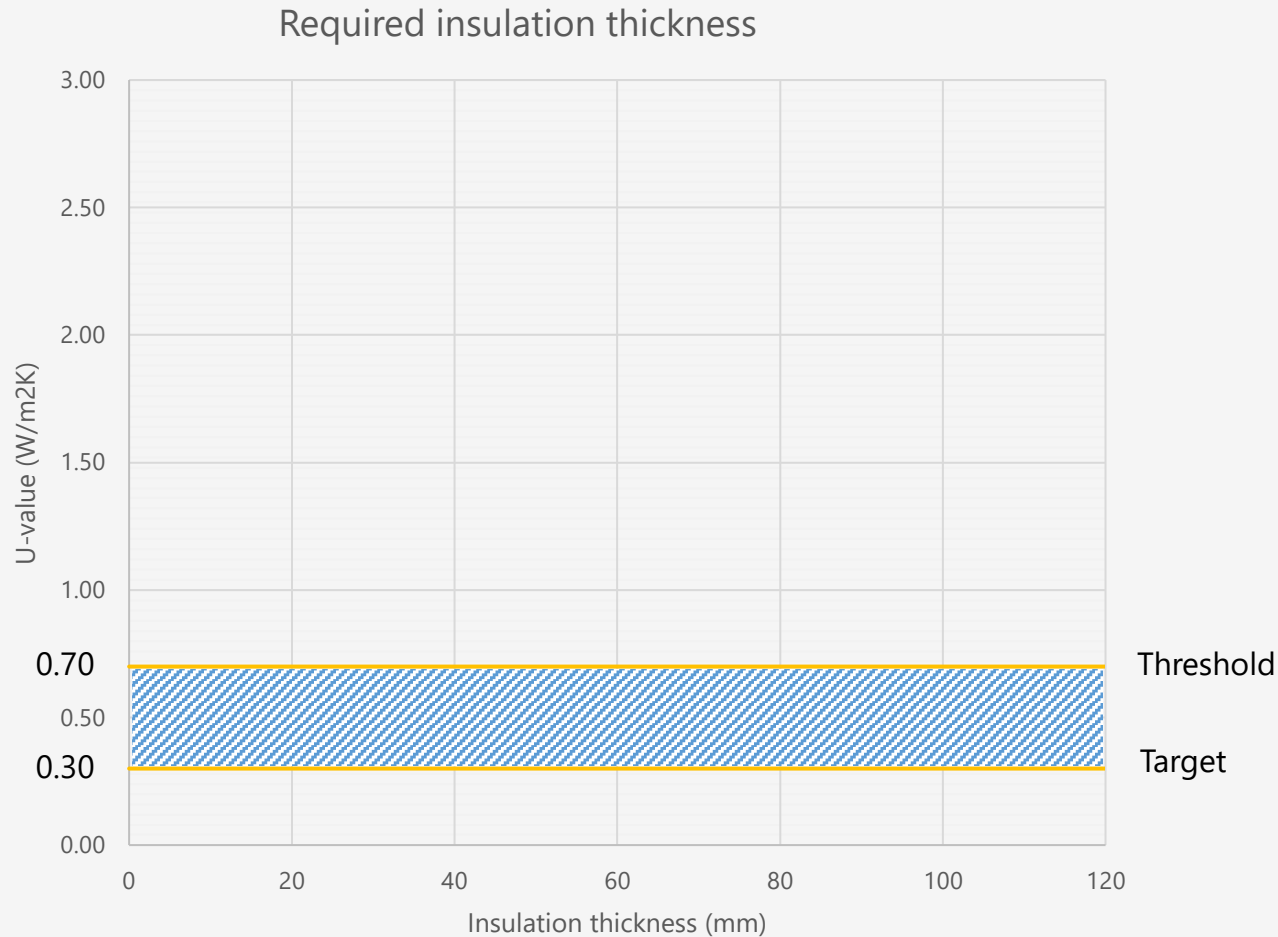
Comfort

Health

Cost

Everybody will have different priorities but a robust long term solution will address as many of these issues as possible. The Building regulations focus predominantly on Thermal performance.

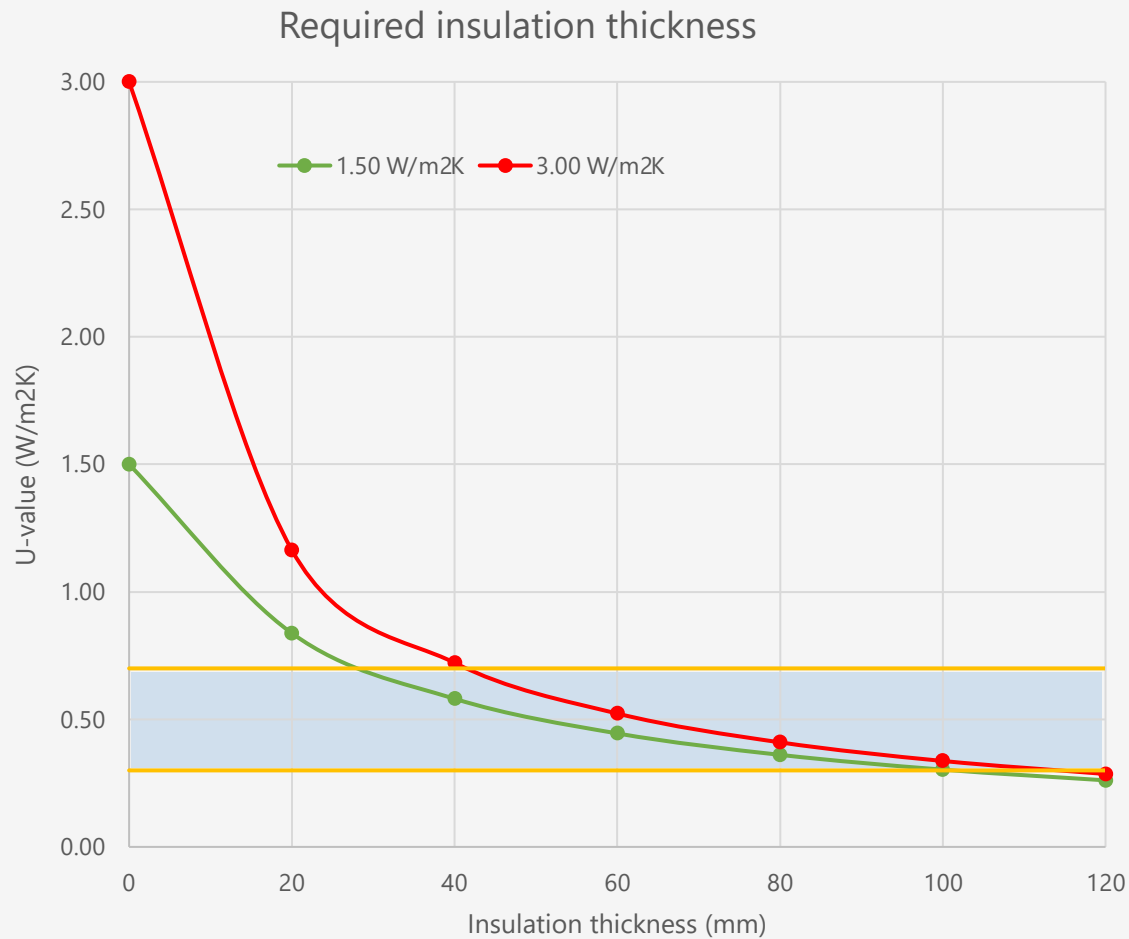
Performance requirements – U-values



The Building Regulations lays out a required thermal performance of 0.30W/m²K for walls with a threshold value of 0.70W/m²K.

In layman's terms this means the performance level can be anywhere within this zone but there needs to be compelling arguments for not achieving a U-value of 0.30W/m²K

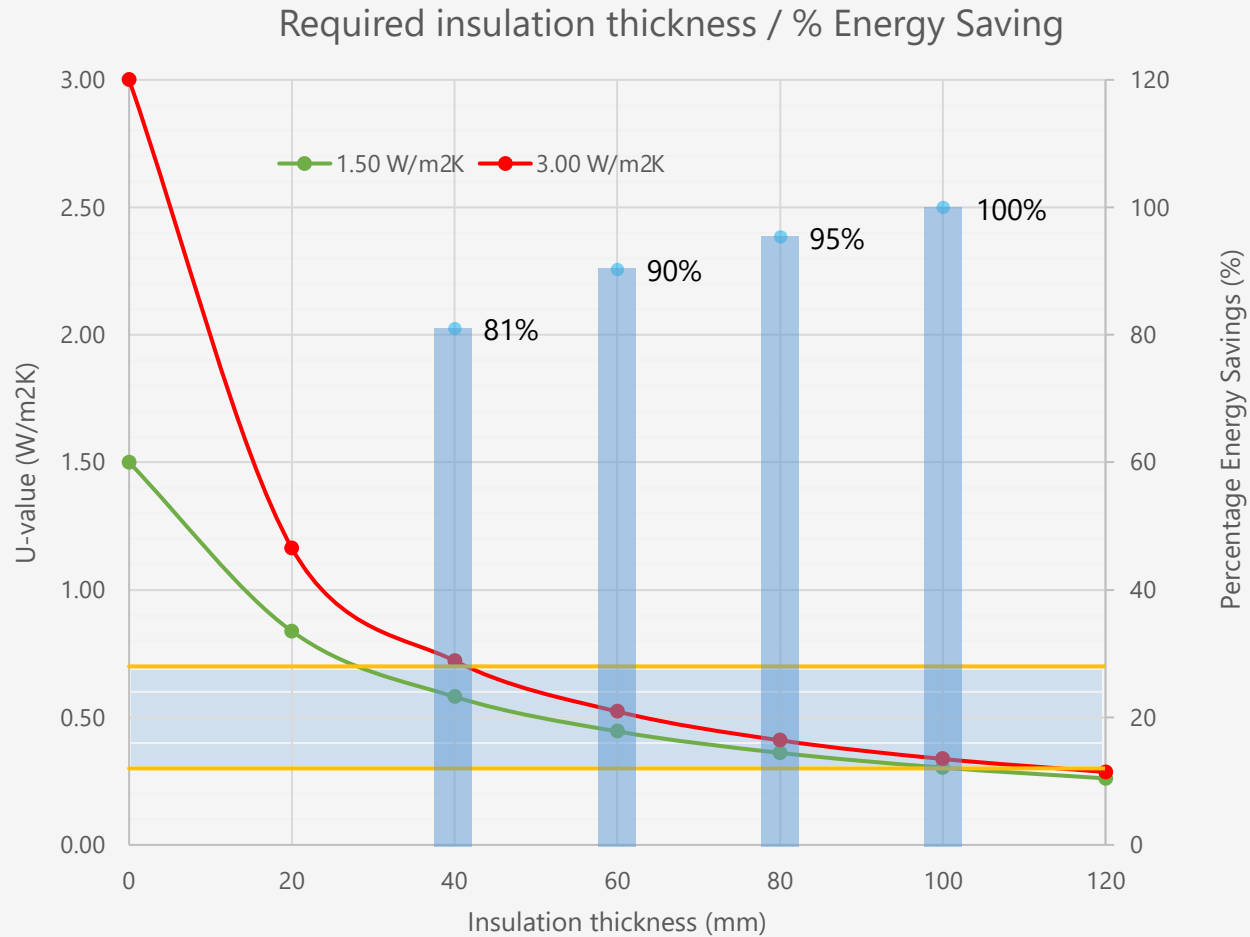
IWI with woodfibre



Depending on the type and thickness of the external wall (brick / stone etc) even a relatively thin layer of insulation dramatically improves the performance and we start to enter the Threshold zone with only 40mm of insulation.

A 60mm layer puts performance right in the middle of this zone

IWI with woodfibre – Energy Savings



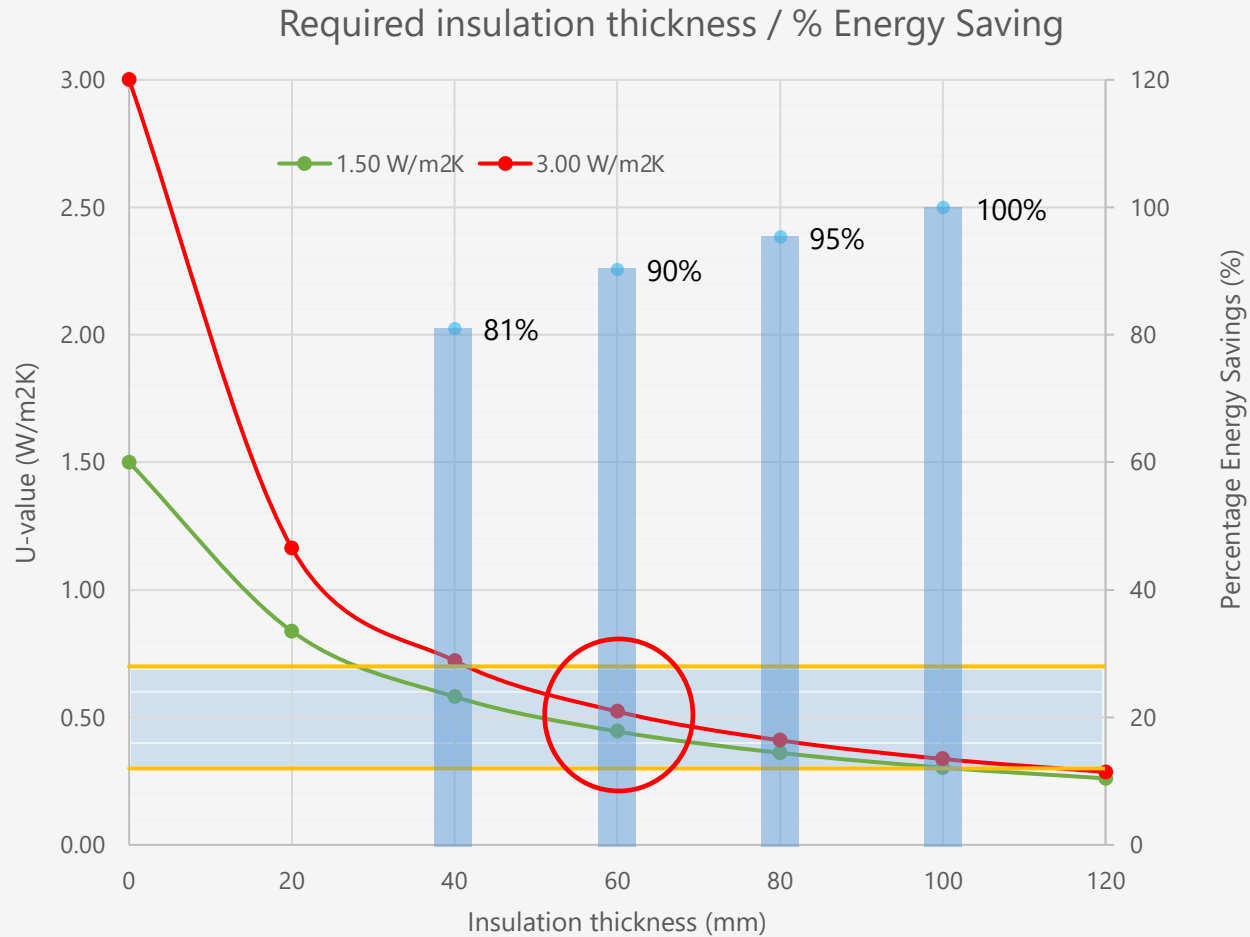
When we look at this in terms of energy savings we see that a thick layer, potentially greater than 100mm, gives us the required performance level of 0.30W/m²k but that a thinner layer also achieves a significant percentage performance improvement.

80mm = 95%

60mm = 90%

40mm = 81%

IWI with woodfibrethe optimum thickness!



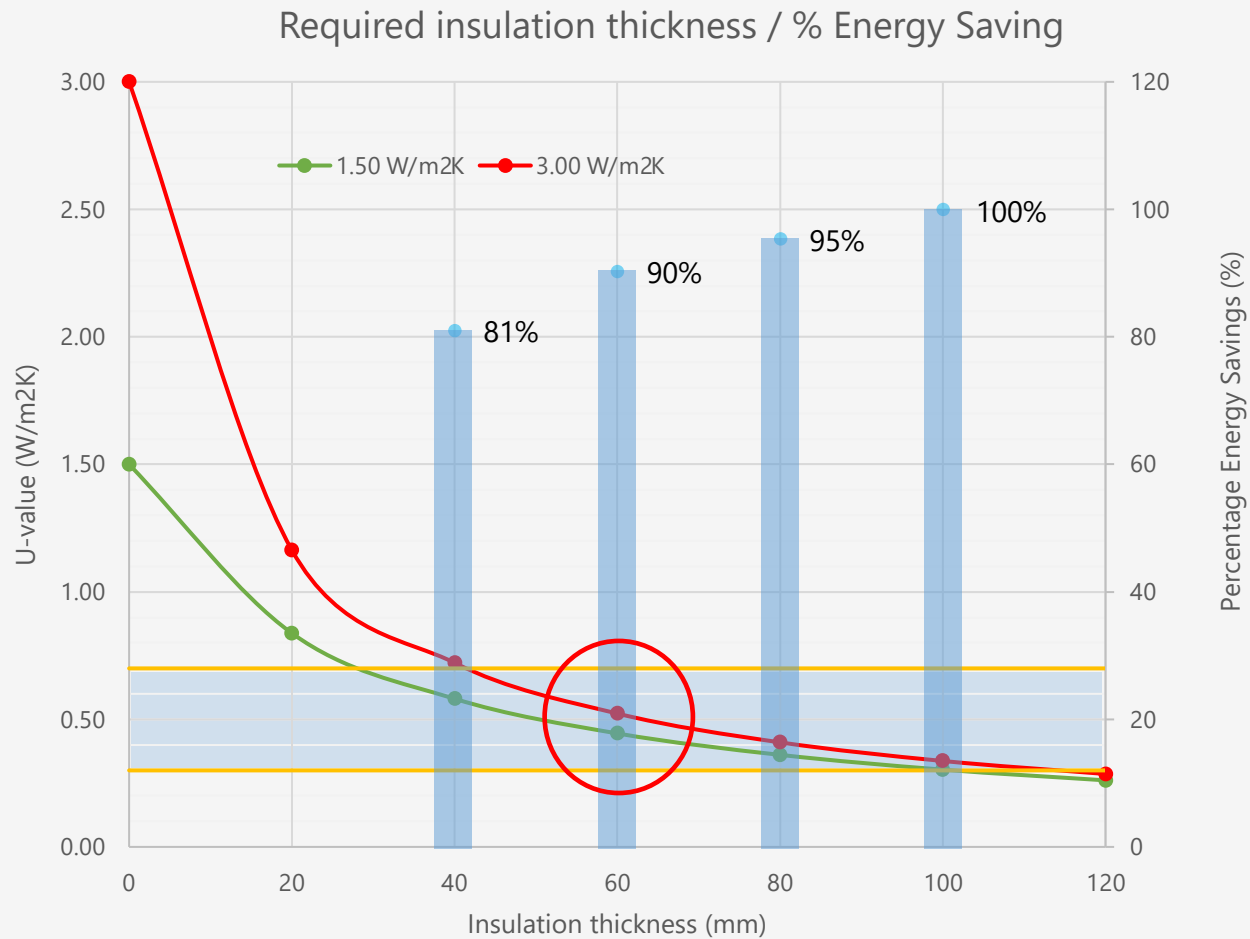
This highlights that there is a sweet spot for IWI that hits the majority of drivers

60mm of insulation achieves 90% of potential Energy Savings....

.....sits right in the allowable zone for Building Regs approval.....

And addresses the other key drivers such as.....

IWI with woodfibrethe optimum thickness!



Air quality - ability of woodfibre to hold and release moisture

Impact on room size - thin layer ensures minimal disruption

Reducing moisture risks - ensuring breathability of the existing building fabric

Reducing petro chemicals - natural and sustainable

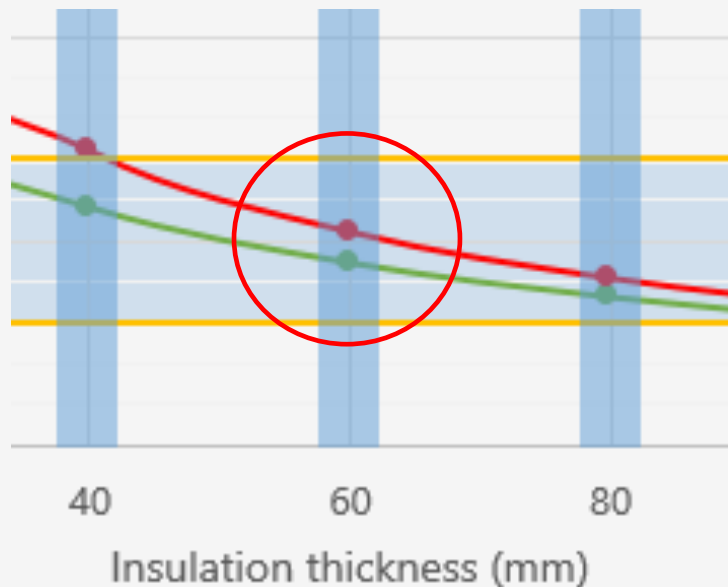
Carbon storage – locks biogenic carbon within the material

Comfort & Health – warm wall surfaces and healthy internal climate

Summary

There are a significant number of existing properties that can be improved by the addition of IWI systems

Concentrating on all the key drivers, rather than just the U-value means we can consider all the impacts, both positive and negative that IWI systems bring with them



Where Building Control are insisting on a U-value of 0.30W/m²K we are creating a robust argument to highlight the benefits of using natural and sustainable materials that provide a cost effective solution and also protect the long term security of the building fabric.

Thank you for your time.

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