Simplifying insulation

Simplicity is something that is often overlooked in manufacturing, showing there is a disconnect between product designers and onsite workers. **RCI's** editor **Gabriel Day** discussed this in depth with **Jason Cureton,** the inventor and founder of **Insulfix,** an innovative product that provides an easy to fit insulation method.

In May 2014, after constructing the roof on an architect's self-build home, it was part of my contract to fit the PIR insulation in between the rafters – a normal job for me. However, after the second day, the client stated that the insulation that I had fitted was incorrect and also pointed out the many bags of waste it producede. He went on about ventilation gaps, gaps in between the rafters and the insulation performance. So, like all tradesmen in this position, out came the expanding foam and tape. I thought there must have been a better way to install PIR. So, that night I went home a hit the web only to find that there was no other method of fitting PIR between rafters.

Taking on the challenge to create such a solution, the UPVC Insulfix Track was born with the main objective being to be able to fit the board in the correct position to maintain the ventilation gap. That is when I came up with the idea of a Track that simply fits over the rafter with a retaining ledge that locks the board into place. When I showed the solution to the architect, he asked "Do you think that it may have a benefit in closing the performance gap?" This set another challenge, which led me to doing some testing, which yielded results I could not believe.

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Closing the performance gap

Earlier this year, the solution underwent a performance assessment through the Built Environment Climate Change Innovation (BECCI) project – an initiative that seeks to develop products and services that reduce carbon usage to improve the existing housing stock – which was conducted by Veritherm.

When testing the heat transfer coefficient (HTC) using the friction fit method inside the testing rig I built, it required 24.5 watts of heat energy (W/K) for the rig to become one degree warmer than the outside, whereas the Insulfix Track product only required 8 W/K to achieve the same result. This proved a dramatic reduction in energy usage, producing a 67% improvement in energy losses.

The testing also revealed that the Insulfix Track product brought the air permeability on the testing rig down from 25.8$m^3/m^2/h$ (using the friction fit method) to 3.56$m^3/m^2/h$ with the Insulfix Track.

Saving time and waste

Overall, the testing calculated that alongside current energy prices, the payback time on using the Insulfix solution is only about 3.7 years.

Moreover, a customer feedback form revealed the dramatic reduction in installation time. A triple garage requiring insulation at rafter level only took four man hours with one fitter to install (who had never used Insulfix Track before) as opposed to the originally estimated 16 man hours with two fitters.

Furthermore, depending on rafter centres, you end up with an offcut between 100 to 150mm wide, which normally you throw away when friction fitting. But with my system, you can cut it up and stack it within the Track, which, at 600 centres, saves 91% of the waste and at 400 centres its about 87.5%.

The solution is also 50% recycled and 50% virgin, but 100% recyclable, with scrap value at the end of its lifespan.

Deskilling the product

My design comes from practical thinking of a worker onsite rather than being in an office and crunching numbers.

On the site trial, the product was delivered, and the testing contractors didn't bother looking at the website for instructions. They just picked it up and figured it out straight away. Now, wherever I go and show people the product and tell them to work it out - no one has ever said "I can't do that".

This comes at a time where all this new stuff is coming out but it's too complicated for workers to use. They don't have time on site to look at datasheets, they just want to pick something up and figure it out.

Why has no one thought of this?

I think it's because the people that produce and design insulation solutions don't understand what happens to them it onsite. This is an issue with a lot of new products, it's alright designing it in an office on a computer, but you need to get it out on site and let tradesmen try to use it.

I didn't design Insulfix for the performance, that's coincidentally taken it over. I really made this to be an easy solution to install and maintain the air gaps. **RCi**

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