



# Warm Feet and NO Drafts

*Six years ago Hannah and Martin Naughton bought a site in Slane, Co. Meath, and moved into the cold, drafty little cottage on the site. In May 2004 they started work on significantly extending and renovating the house, with a commitment to using natural building materials and energy efficient technology. They moved in to the extension in February 2005, and work is set for completion late in Autumn. Hannah Naughton explains how the healthy, warm and comfortable home has surpassed all the family's expectations.*

In 1999, my husband Martin and I found a little cottage in County Meath on one acre of land surrounded by lovely landscape. We decided to buy it rather quickly feeling that this could become a real home to us - and hopefully our children to come. Martin hit the bull's eye with the dart in the pub nearby and that kind of sealed our decision. However, from the day of the first viewing we knew that we wanted to extend and renovate the building, to create additional living space and

improve the standard of the little house. A couple of years and two kids later we managed to get there.

#### **Where we wanted to go to**

We loved the cottage but we always had cold feet from living in it. Our little babies suffered from snotty noses throughout the winter. Drafts made it rather uncomfortable to sit anywhere away from the open fire in the evening. And besides the fact that the radiators

were hardly up to heating the house, we never had hot water and by far not enough of it, as the hot water and the radiators were on the same heating cycle.

So we decided to build what we wanted for the place; to be able to run around barefoot, not having to wear a thick fleece inside the house all the time, for the kids to have a bath in comfort, for us to be able to have hot, long showers and overall a warm, comfortable house. We did not want to pollute the environment in achieving all of this. Instead of the diesel fumes that accompanied any action from our old oil burner, we felt we had to do something far more environmentally friendly. On top of this, we did not want the bills to go through the roof with all the comfort that we might be able to establish.

Our goal was to achieve a warm house with hot water at any time, whilst being environmentally friendly and keeping running costs at a minimum. Whilst planning the design of our house, more and more of the discussions with our architect Deepak Abbi from Drogheda

were concerning this issue. The Internet proved to be a great source of information on top of all the advice we received from everybody we met along our project.

### Where our heat and warm water comes from

Our old oil burner was dirty, smelly and probably not very efficient. We wanted a much cleaner and more efficient option for the new house. Now, as I am German and a lot of very efficient appliances and building material in the heating and plumbing area are available in Germany, I started enquiring about different options there. With the help of my father, we started discussing with a German plumber what solution might be best for our house.

We decided to install a Viessmann condensing gas boiler that has an efficiency rate of around 108 to 109 %, which is higher than most models on the market. We went for a condensing boiler because the burner then uses the warm air from the burning process to heat up the cooler water that comes back from the radiators. The return water goes back into the burner on a higher temperature level and needs little heating up. You have to make sure that the returning water is cool enough for this to work with full efficiency though.

We chose gas because gas boilers can regulate how much gas is burned more efficiently than an oil burner can regulate the flow of oil, as well as the fact that the diesel and kerosene provided

in Ireland is not suitable for condensing oil boilers. The Viessmann boiler has separate circulations for the radiators and the hot water cylinder—a pressurized and well insulated Tribune 210 litre cylinder that gives us perfect water pressure. It works with hot water prioritised and will therefore heat up the required water first. Also, we can have hot water in the summer without having to run around and turn off single radiators (and on again on a chilly evening). Another advantage is that gas burns very clean, and no smelly fumes come floating into my kitchen anymore. There might be a bit of steam coming out of the neat pipe that sticks out at the wall of the utility room and the odd drop of water, but that is it.

### How the heat is distributed

We wanted radiators that use water at a lower temperature in order to save energy. This can be done with modern radiant radiators made from steel rather than cast iron. The radiant heat also has an advantage from a health point of view, as the respiratory system would be under more stress from convection heat, which also distributes more dust from the inside of the radiators into the rooms and dries the air out more. We decided to go for Zehnder radiators that now run nicely with a water temperature below 40 degrees Celsius, and also look beautiful.

We wanted each radiator to have its own thermostat to allow us to adjust them individually, with all radiators mainly regulating themselves according

to settings chosen with the thermostats. As a consequence, each radiator has its own warm water cycle with a pipe in from and a pipe back to a manifold. We have two manifolds installed, one for the old and one for the new part of the building. Each thermostat sucks as much warm water from the manifold as it needs to bring the radiator up to the set level of heat and sends the cold water back. This means that the various rooms in the house can have different temperatures, such as the bathrooms being warmer and the bedrooms being cooler. This also means that the radiators shut down automatically when we light our wood-burning stove, as it releases massive heat into the house—unlike the open fire place where most of it actually went out the chimney.

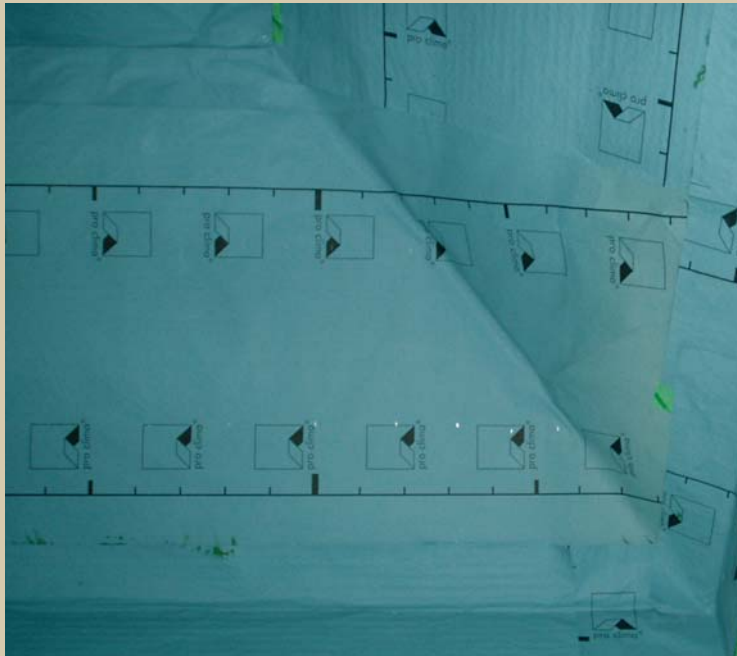
### How the warmth is kept in the house

During all the discussions while preparing to build our house, one important point became clear to us: whatever you choose as a heat source, make sure the energy and heat that you put into the building stays in as much as possible! This meant that we needed to insulate as much and as well as possible. We put 70 mm of Hytherm insulation underneath our concrete floor and 50 mm towards the outside walls. Finally we can all run around barefoot in comfort in our home, upstairs as well as downstairs!

We also went for highly energy-efficient windows from Rationel windows. The glass of these windows has a U-value of just 1.1. There are no drafts coming

(anti clockwise from bottom left): the pre-engineered timber frame structure takes shape with walls, roof and doors being erected





(above, below centre & below left) Homatherm holzFlex040 wood fibre insulation, cut to fit neatly into the compartments of the timber frame (left & below right) airtightness was achieved using the pro clima airtightness system, sealing DB Plus paper with proprietary tapes & adhesives

through these windows, and even moving close to the window panes hardly makes you feel the outside cold. This was an important decision along the way because our huge windows, which let in any tiny little bit of the Irish sunshine and give the impression of an outside life in the Irish country side while sitting in the warmth of a dry home, are potential weak spots of our house. But we feel certain that these windows are actually doing more than their job as they also look absolutely beautiful!

One of the reasons why we decided to build a timber frame house was due to the possibilities to insulate well. Riverview Timber Frame Systems Ltd.

from Kinnegad in County Westmeath provided us with a high-quality timber frame house, which they also clad, and told us about Homatherm holzFlex040 wood fibre insulation material for the first time. Again, we took the opportunity to check this out directly in Germany, as it is produced over there. What we heard sounded really good, and having chosen this insulation even with it being rather expensive, we learned more good news about it from Niall Crosson (whom Riverview Timber Frame put us in contact with) at McCann and Byrne Ltd. from Athboy, who turned out to be a great source of information on all sustainable building materials (and a big fan of my home-made German sour-dough bread).

Well the U-value is rather impressive and our house is warm, and even on cool days the radiators don't get hot. The heat stays noticeably in the house. We learned that a timber frame house with Homatherm holzFlex040 is also able to keep the inside temperature at a comfortable level which has been great in the recent sunny weather. We are also noticing that there is a very comfortable living and breathing atmosphere at all times in the house. We often laugh that we are only imagining this, seeing that we paid so much money for this non toxic insulation but then again, it really seems to be true.

However, it is not only the Homatherm





(above left & below right) the rendered and painted exterior of the house

holzFLex040 that is keeping the warmth in the house. When installing insulation, you should also make your house as airtight as possible. We used breathable paper, DB PLUS, that lets humidity from the living space out into the wood fibre during the cold winter months and also back during the warm summer months that is then glued and taped together to not let any drafts blow away the warmth in the house. Using the pro clima air tightness system, including DB PLUS and the proprietary tapes and adhesives, we ended up wrapping and taping our house like a precious birthday present in blue pro clima DB PLUS paper, having already stuffed it like a Christmas turkey for days on end. Even the smallest hole and gap got a bit of tape over it and all the cables and water pipes going through the pro clima DB PLUS paper were wrapped in some extremely sticky, flexible white tape that ruined the last bits of my patience and my fingernails.

Because we did the insulation work ourselves, with Martin doing the stuffing, whilst I mainly did the wrapping, we had to cut the Homatherm holzFlex040 (and we had piles of it in the beginning) to fit neatly into the compartments of the timber frame. Martin cut these big

heavy chunks into nice artwork that just fit into all corners, square and triangles.

This process came with a very positive revelation: while Martin was working with the insulation, he had no problems with his eyes or nose, his respiratory system or his skin. The 'itchy stuff' as our kids called it was bulky to handle, but no health risk at all. Martin did have red eyes in the evenings when he worked overhead or in closed corners but these were gone in the morning and that was very different when he took out the fibreglass from the cottage roof! It was a good feeling to put something so clean into our house. In the beginning we did not realise that we would leave a big pile of rubbish by insulating our house with fibreglass, but we feel great because there is something so natural in our walls now.

One day, Niall Crosson came to show us the fire test. Martin had a gas bottle handy and we set fire to a piece of fibreglass, rock wool and Homatherm holzFlex040 wood fibre. Well, a match would have done the trick with the first two materials, but the Homatherm did not even get hot with the gas burner. There was no flame, no smoke and just a bit of black surface afterwards. This

was another impressive confirmation for us that we made the right decision.

Another positive we have noticed is the sound insulation of the Homatherm holzFlex040. We can hardly hear the noise from the cars flying down the country road besides our home. This made us think that we could also use it for the internal walls - as sound insulation as well as a heat barrier, so that each of us could have our preferred temperature in the bedroom.

We have been living in the new house for just over 5 months now and are as happy as Larry. Our eldest daughter said today that the old house was like Mr. Messy and the new house is like Mr. Tidy, in line with the Mr. Men library the kids love so much! So far we have used just over half of the first filling of our LPG tank outside which is obviously a good achievement. But the next two years will show us if we have achieved the third of our goals of low running costs, as we have definitely met two of them so far, in that our house is warm and environmentally friendly.

(above right) the Veissmann condensing boiler and (left) Zehnder radiant heaters

