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TECHNOLOGY

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# Insulation flaws

*Timber suspended floors are being touted as the best way to meet new insulation requirements. But how will the great British condensation problem be handled?* Graham Ridout *sees solutions in Scandinavia.*

THE NEW DICTATE to insulate ground floors in the revised Building Regulations will create a good deal of head scratching over the next few months. In particular, there will be confusion over how the new requirements can be met and what the potential problems might be with the insulation that is chosen.

From 1 April, all buildings – dwellings, industrial and commercial – will have to meet the requirement for a U-value of 0.45 W/m$^2$K.

For housebuilding, the timber industry is particularly eager to get over the message that the best way of meeting the new energy efficiency requirements is to use timber suspended floors.

At face value, the method looks an attractive proposition. Fitting the insulation between the joists is a relatively easy task with a choice of two methods. Insulation quilt can be used, supported on plastic mesh spanning the joists, or rigid insulation boards can be fitted, resting on battens, clips or corrosion-resistant nails.

Either method is all very well for insulating floors for "dry" rooms. But for "wet" rooms (bathrooms, kitchens, and utility rooms), there are question marks over whether condensation and long-term damage to the timber substructure from water spillage can be countered effectively.

Pointedly, the UK approach to both these potential risks is markedly different from Scandinavian practice.

For instance, the Building Research Establishment's design guide *Thermal Insulation: Avoiding the Risks* recommends the following practices for controlling condensation:

☐ with suspended timber floors, small amounts of condensation may form. They can be ventilated away.

☐ it is not necessary to introduce a vapour barrier into the construction. Ensure that the sub-floor space is cross-ventilated through the openings in the wall not less than either 1500 m$^2$ per metre run of the external wall, or 500 mm$^2$ per square metre of floor area, whichever gives the larger opening.

On long-term damage from water spillage, the BRE guide recommends:

☐ for suspended timber floors, the potential damage from water spillage affects not only the floor boarding, but also the timber structure. Without a vapour barrier, water will soak through and gradually ventilate away.

☐ chipboard flooring in bathrooms and kitchens should be moisture resistant (BS 5669, Type II/III) and consideration should be given to protecting the floor with a polyurethane sealer or welded vinyl flooring.

☐ allow an expansion gap of 10 mm, or 2 mm per metre run of floor, whichever is the greater, at the perimeter of the chipboard flooring.

In Norway, the basic floor construction is treated on a par with that of a timber-frame wall panel where the insulation is sandwiched between a vapour barrier and a breather membrane.

Norwegians also use a continuous floor covering of welded vinyl which is dressed up the walls. This forms an impenetrable barrier that prevents water getting to the timber (see drawing).

Norwegian floor design brings air leakage rates down to a bare minimum because the method of construction reduces the number of air changes to less than two per hour.

By contrast, tests conducted by the timber research body TRADA show that the average British timber-frame house has around 15 air changes per hour. In the UK, adequate ventilation rates have always been assumed to be the best way to tackle condensation.

Norway tackles condensation by either passive ventilation methods, such as trickle ventilators fitted to the windows, or active systems like mechanical extractors coupled to a heat exchanger. Ventilating the void beneath the floor is standard practice.

While the new UK requirement to insulate floors is undoubtedly an improvement, the emphasis has been more on providing insulation as the route to energy efficiency rather than cutting down air leakage.

The Norwegians do not seem to experience the same sorts of problems with condensation as in Britain. The climate is just as severe as the UK's. So it might just be that their approach does have some merit and could provide an answer to the head scratchers in the UK.

**Section showing Norwegian floor construction**