

# **NEW BUILDING REGULATIONS WILL DRIVE HEATING UNDERFLOOR**

Brian Sensecall of UHMA predicts the underfloor heating sector will benefit from the latest energy saving legislation

We live in fast changing times. The new Building Regulations 2006 was introduced at a moment when the Government is determined to reduce energy consumption and carbon emissions from fossil fuel fired power stations and we see rising prices for imported gas and oil,

Electric heating systems are already increasing in popularity and I believe that the swing to underfloor heating (both warm water and electric) will increase - with greater emphasis on more sophisticated control.

Low energy floor heating systems began to make serious inroads into the market share of conventional systems about five years ago. The benefits in terms of comfort, invisibility and freedom from maintenance had finally become widely appreciated and the cost price of a system had fallen in real terms.

## **Crucial factors**

The two crucial factors focussed on in the 2006 Regulations are:

- a) Thermal Insulation of the Floor Heating System and
- b) Time and Temperature Control.

Since downward heat loss increases as the floor finish resistance increases, the U-value of the floor cannot remain the same if system efficiency is unchanged.

The Part L1a floor U-value of  $0.25 \text{ W/m}^2\text{K}$  will just cope with the thinnest of vinyl floor finishes, but not the opposite end of the spectrum where thick carpets and underfelt are involved. The design downward heat loss limit in British Standard EN1264 Pt.2 is given as  $10 \text{ W/m}^2$  at maximum surface output – which for system comparison can be interpreted as an additional layer of thermal insulation valued at 10 times the extra floor finish resistance,

For intermediate floors, which are not regulated thermally in Part L1a, the value of insulation required by BS EN1264 is  $R = 1.25 \text{ m}^2\text{K/W}$  for heated floors over unheated rooms, or the lesser value of  $0.75 \text{ m}^2\text{K/W}$  for heated floors located over heated rooms. Conversely it is reasonable to argue that multi-storey apartments should be assumed as “unheated” for the purposes of design. *It's hardly just that*

*the occupier in the flat below should receive heat free of charge from the person above as a result of a mistake by the floor heating designer.*

Under tile heating systems, whether by warm water or electric cable, may be resolved by installing thermal insulation equal to 10 times the resistance of the tile and its bedding, which will usually result in a thermal R-value  $\leq 0.20\text{m}^2\text{K/W}$  (equal to approx 6mm extruded polystyrene)

### **Control system**

The choice of control system is an area of great potential reward to both designer and end user. The use of modern digital electronic thermostats, often with time control and incorporating dual sensors (floor and air) will certainly provide better time and temperature control - plus the bonus of safe floor temperatures.

Conventional floor heating utilising heavy concrete floor screeds is known to provide better performance when the system is controlled by an electronic weather compensator (or anticipatory controller for cable heating). This type of control eliminates the cyclic bursts of concentrated heat input associated with floor and room temperature “overshoot” when the weather turns warmer.

Electrical systems can utilise a mixture of night storage (low tariff) energy cables (80%) and day energy cables (20%) to achieve extra flexibility with compensated control systems – thus providing better comfort.

More sophisticated controls may have a price premium, but the time may be coming when this is nullified by the need to keep within the law and the price of the fuel saved.