

Natural Stone Specialist Editorial  
Article 3  
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#### Fixing Natural Stone to Heated Floors

Heated floor systems have become increasingly popular over the last few years and are suitable to receive most types of floor finishes. Ceramic tiles, natural stone and synthetic stone all have low thermal resistance values making them particularly suitable for use on heated floors.

There are two categories of heating systems which are:

- (i) Heated pipes or electrical cables which run through the screed or base (generally referred to as underfloor heating).
- (ii) Systems that are installed beneath the tiled surface (generally referred to as undertile heating).

In both instances it is essential that the adhesives and grouts used to fix the tiles are capable of withstanding thermal movement. A suitable polymer modified cement-based adhesive, which conforms to BS EN 12004: 2001 "Adhesives for tiles – Definitions and specifications" C2 classification, should be selected. The type of tile selected and nature of the substrate will also dictate the final adhesive selection. For instance tiles which are 300mm x 300mm or greater should be fixed using a pourable thick bed adhesive, which will allow solid bed fixing to be achieved more easily than typical standard type adhesives. Light coloured or translucent natural stone should be fixed using a white adhesive.

In respect of grouts, these should be polymer modified cement based, conforming to BS EN 13888: 2002 "Grouts for tiles – Definitions and specifications" CG2 classification should be selected.

Generally when fixing to cement: sand screeds incorporating heating pipes the screed must be a minimum of 3 weeks old before the heating is brought to its intended operating temperature. It should be maintained at that temperature for a minimum of 3 days and then be allowed to cool to room temperature. The heating may be switched on 14 days after completion of tiling, raising the temperature gradually at a rate of 5°C per day. It should be noted that when limestone or travertine tiles are to be fixed, an extended drying time will be required to ensure that the screed has a Relative Humidity of not greater than 75%.

Undertile heating systems must be installed in accordance with the manufacturer's recommendations. Loose cables may be covered using a single layer of a suitable C2 cement-based adhesive or with a suitable levelling compound, taking care that the cables are not damaged. The adhesive or levelling compound should be allowed to dry before tile fixing commences.

When fixing to timber floors it is essential to ensure that the floor is sufficiently rigid and deflection free to support the tiled finish. A good guide to testing the amount of deflection in the floor is to perform the 'Meniscus Test'. This involves filling a glass to the rim with water and placing it on the floor. Standing at a 1metre distance from the glass bounce up and down on the floor. If the water spills out of the glass then the floor requires strengthening.

Timber floors may be strengthened by overlaying with a minimum 15mm WBP plywood which is dimensionally stable to changing moisture conditions or a suitable tile backer board. The boards should be screw fixed to the joists and existing boards at maximum 300mm centres.



It is essential that movement joints are provided. These should extend through the tiling and its bed and coincide with any structural movement joints. British Standard BS 5385: Part 4 recommends that movement joints should be provided around the perimeter of the tiled installation. In larger areas, intermediate movement joints should be provided at 5m intervals in both horizontal directions. On suspended floors stress relieving joints should be provided over supporting walls or beams where there is a risk of flexing.