CERAMIC & NATURAL STONE FLOOR TILING TO HEATED SUB-FLOORS

INTRODUCTION

There are a variety of different types of underfloor heating systems to choose from. The more traditional method of heating a floor is the use hot water pipes. These can be laid into a screed, either traditional cement: sand or Calcium Sulfate/ Anhydrite. There are a variety of electric under tile heating systems to choose from, the most popular being the cable systems and heating mats which are usually laid onto a thermal insulating board. **N.B. Always check with the heating manufacturer as to the suitability of the system with the proposed substrate and its use within the chosen working environment.**

PREPARATION

Before starting work you must ensure that the following points are taken into consideration:

Hot Water Pipe (Traditional cement:sand screed)

Floors with underfloor heating generally operate below 30ºC. The heating elements are usually incorporated in a suitable mesh reinforced mortar screed with a minimum thickness of 65mm (residential) or 75mm (commercial), before tile fixing commences.

- The screed should be allowed to dry out for at least 3 weeks if containing Portland cement to BS EN 197-2 2000 CEM1 strength class 42,5/52.5N.
- After drying out, the screed should be heated slowly at a maximum rate of 5ºC per day to up to the maximum operating water temperature of 45 °C as recommended by the heating manufacturer and maintained at that level for 3 days before being allowed to cool to room temperature.
- The heating system must have been turned off or in cold weather turned down to below 15ºC.

On completion of tiling, when using Building Adhesives Limited flexible floor adhesives and grouts, ensure that a minimum of 14 days elapse before the floor is brought to its operating temperature at a maximum rate of 5ºC per day.

Anhydrite/Calcium Sulfate screed

Where the pumped calcium sulfate screeds are installed as heated floating screeds then the screed should be laid with a minimum 25 mm cover over the heating pipes or wires. The heated screed should have appropriate movement joints passing through the screed and tile bed so that provision is made for the thermal expansion and contraction of the screed and the applied ceramic floor tiling.

For further information, please see BAL Technical Note TN 33.17 Tiling to Anhydrite Screeds.

- Allow the screed to dry for a minimum of 7 days before commissioning of the underfloor heating. Consult with screed manufacturer whether laitance removal should be carried out prior to commissioning.
- Gradually increase the temperature by approximately 5°C per day until the maximum required working temperature is reached. Maintain this temperature for a minimum of one week or as recommended by the manufacturer. If force drying of the screed is required, do not exceed a temperature of 55°C.
- The heating system must have been turned off or in cold weather turned down to below 15ºC.

Electric Under Tile Heating (cable/mat)

Check the system with the manufacturer to ensure that it is compatible with the substrate that it is to be applied to and to the environment it is to be used in.

The cables/mats are normally adhered to a suitable insulation (tile backer) board following manufacturers recommendations. It is usually recommended to encapsulate with a suitable self-smoothing/levelling compound i.e. BAL LEVEL MAX from the BAL range. This will help ensure that:

- Electric wires or cables are not damaged when combing adhesive through with a trowel
- There are no voids or air gaps left in the layer between heating and tile, which can potentially damage the heating system and create weak spots under tiles when loaded.
- The maximum adhesive bed thickness for adhesives are not exceeded.

Where an electric system is to be installed above a suspended timber floor, please see BAL Technical Note TN 11.17 Tiling to Timber Floors for further information.

UNCOUPLING MEMBRANE

Uncoupling membrane systems provide an intermediate substrate between the tile covering and load bearing substrate. They can be used over a variety of substrates, which include timber, concrete, cementitious screeds and gypsum-based screeds, etc. They are designed to neutralize lateral stresses that occur between the substrate and tile covering; they are not designed to accommodate differential vertical movement. The membrane works by preventing stresses from the substrate being transferred into the tile covering; this prevents cracking and possibly delamination of the covering material.

Consideration should be given to the use of an uncoupling membrane e.g. BAL RAPID MAT or BAL FLEXBONE VAried when ceramic tiles are to be installed above a heated floor. When natural stone is to be installed above a heated floor, an uncoupling mat should always be used.

MOVEMENT JOINTS

Movement control joints should be incorporated at all perimeters of the screed, and also around all upstands or anything which penetrates the screed. These joints are usually formed whilst the screed is being laid, by installing pre-formed 10mm thick strips of expanded polystyrene against the wall or upstand. It is essential that movement control joints penetrate the full depth of the screed.

Tiles should be bedded in cement and sand mortar onto a separating membrane in accordance with BS 5385 Part 3: 2014. Movement control joints should be incorporated at all perimeters and upstands, to coincide with those in the reinforced base screed. Intermediate movement control joints should also be incorporated where there is underfloor heating. The tiling should be divided into bays measuring no greater than 40m^2 in area and no side should exceed 8m in length.

Intermediate movement control joints should penetrate through the thickness of the tile and bed down to the separating membrane placed on top of the reinforced base screed.

Allow ideally 28 days (14 days minimum when using BAL adhesives) after completion of the tiling before initially bringing the floor back up to its operating temperature at 5ºC per day.

Proprietary systems may recommend alternative drying times, screed thicknesses, adhesives or grouts, and these recommendations should be followed when such systems are installed.

SUITABLE ADHESIVES

For concrete, cement: sand screed, anhydrite screed or plywood overlaid floors (minimum thickness 15mm):
BAL SINGLE PART FLEXIBLE
BAL RAPID FLEX ONE
BAL MAX FLEX FIBRE
BAL POURABLE ONE
BAL SUPERCOVER RAPIDFLEX
BAL SUPERCOVER RAPIDSET with BAL ADMIX AD1 diluted at 1:1 with water
BAL CTF4 with BAL ADMIX AD1 diluted at 1:1 with water

SUITABLE GROUTS

BAL SUPERFLEX WIDE JOINT GROUT
BAL MICROMAX2 GROUT
BAL MICROMAX2 GROUT with BAL ADMIX GT1 diluted at 1:2 by volume with water.
BAL WIDE JOINT GROUT with BAL ADMIX GT1 diluted at 1:1 with water.
BAL FLOOR EPOXY(small areas only)
BAL EASYPOXY AG (small areas only)

If there are any questions as to the use of adhesives or grouts with underfloor heating please do not hesitate to contact the BAL Technical Advisory Service.

THE BAL 25 YEAR GUARANTEE

BAL products are supplied with a 25-year product guarantee. For further details and/or copies please contact the Company's marketing department.

TECHNICAL ADVISORY SERVICE

For free expert guidance on the use of BAL products, or any aspect of ceramic tiling contact the BAL TECHINCAL LINE on:
Tel: 0845 600 1222 03330 030160?, Fax: 01782 591121

NOTE
The customer must verify the suitability of any information, opinion, recommendation or advice ("information") provided by the Company for the particular application for which any goods are intended to be used and the Company accepts no liability (whether in contract, tort or otherwise) whatsoever for any loss, damage or expense arising from the misuse of any information it supplies, nor for the use of any information in or for applications which are unsuitable or inappropriate. Building Adhesives Ltd operates a continuous research and development programme and reserves the right to alter or to update information from time to time.

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