

TECHNICAL NOTE TN 11.16

TILING TO TIMBER FLOORS

Timber

Several considerations should be made when laying tiles on any timber base, most of which are detailed in Section 6 of the current British Standard Code of Practice BS 5385: Part 3 2014, clause 6.3.4. The appropriate mechanical properties required for floor finishes are discussed in section 6.3.4.1 of this document.

There are several timber board products on the market which are considered unsuitable to receive tiling. The suitability of the board to receive a tile finish should always be checked with the manufacturer prior to tiling.

Wood is a deformable and hygroscopic material which is not ideal in areas where changes in humidity and temperature can fluctuate. BS 5385 Part 3: 2014 6.3.4.1 – *“When it is necessary to install wood based sheets and boards such as plywood, it is important to ensure that the moisture content of the wood based sheets and boards are close to the equilibrium moisture content that prevails under the service conditions.”*

The design of the floor should take into account initial drying shrinkage of the timber and subsequently movement. Timber floors of faulty construction often behave unsatisfactorily as a result of surface evaporation of moisture.

Timber also provides an additional element of stress on the floor to that of solid floors which in turn can result in a potential for damage if not prepared properly. This is because the substrate is more likely to expand and contract at differing rates to that of the tile. This is amplified when temperature and moisture are changeable i.e. heated floors, prolonged sunlight and constantly damp environments.

The laying of floor tiles on timber may provide an impervious covering, and in these circumstances the moisture content of timber may rise significantly to create conditions suitable for fungal attack (e.g. dry rot) to occur. Before fixing commences it should be established that the ventilation is adequate and that effective damp proof courses are correctly located.

New Timber Floors

New timber bases should be designed not merely to carry the additional static load (weight of the tiling system) but also the anticipated dynamic loading in service i.e. in order to provide a rigid floor, noggings may be required between joists to and support the joints of the boards or sheets.

In particular:-

1. Appropriate exterior grade plywood sheets of a minimum thickness of 15 mm is recommended in BS 5385 Part 3: 2014.
2. The boards should be conditioned to adjust to the site conditions i.e. a moisture equilibrium should be reached which is appropriate for the site conditions.
3. The lower face and edges are sealed with BAL BOND SBR to prevent moisture atmospheric moisture ingress and thus reduce risk of distortion or warping.

BS 5385 Part 3: 2014 recommends in clause 6.3.4.2 that in existing or newly laid floors - *“If it is considered necessary to further reduce or eliminate the risk of movement, an additional layer of sheets of minimum thickness 10 mm, resistant to moisture and thermal movement, should be screwed over the plywood at 300 mm centres ensuring that the joints in both layers of sheets do not coincide”*.

Note: The BS 5385 standard does not recommend 10 mm thick plywood overlays onto new timber bases. Plywood overlay minimum would be 15 mm. Please consult cement backer board manufacturers for their specific guidelines.

Existing Timber Floors

BS 5385 Part 3: 2014 recommends *“Existing timber bases to be covered by tiles should be checked to ensure that they are sufficiently strong and rigid. They should be examined to determine whether they can carry the additional dead load of up to 0.8 kN/m², and the probable dynamic loading, without excessive deflection. Consideration should be given to removing existing boards and then stiffening the floor*

with noggins and joist support sleeper walls before following the recommendations for new timber floors”

Deflection

As a general guide, the floor should have minimal vertical deflection under load, typically for ceramic tiles, the floor should not deflect any more than 1/360 of the span of the structure or 1/720 of the span in the case of most natural stone. However, dependent upon local conditions and individual site requirements, the floors, once assessed may require to be more rigid than 1/360. Advice should always be sought from a Structural Engineer.

PREPARATION

Method 1 – Timber Overlay

Some existing floors may require strengthening, e.g. with an overlay of exterior grade WBP plywood, to BS EN 313-2 or marine grade plywood to BS 1088. BS 5385 Part 3 - 2014 recommends as above.

Prior to fixing timber in place, the underside and edges of the plywood should be sealed with BAL BOND SBR. Lay the boards with cross-joints staggered and a 0.5 to 1 mm gap between boards. Fix the sheets with stainless steel countersunk screws at 300 mm centres with screw heads set flush with the surface.

Method 2 – Direct Fixing - Plywood/Chipboard

Plywood sheets should be of a suitable moisture resistance i.e. exterior grade (as detailed above) or Chipboard (as defined in BS EN 309).. Plywood or Chipboard should be screw fixed to seasoned timber joists at a maximum of 300 mm intervals, including cross noggings ensuring a stable deflection free floor. It is important to ensure that the edges/junctions between the boards are fully supported and that the reverse side and edges of the board are sealed using BAL BOND SBR to prevent distortion from atmospheric changes. Priming of the upper surfaces is not necessary. Always check the suitability of the board for the intended application with the manufacturer.

Method 3 – Direct Fixing - T & G Floorboards

Where the floor is considered rigid enough to allow direct fixing, all traces of previous finishes (e.g. stains, varnishes) should be completely removed mechanically prior to tiling. Tongue and Groove floorboards should then be primed with 2 coats of undiluted BAL PRIME APD and allowed to dry prior to the laying of tiles.

ADHESIVE

Fixing of Tiles to a rigid and stable timber floor (Methods 2 & 3)

When fixing directly to stable, deflection free, single layer timber; tiles may be laid in a solid bed of BAL SINGLE PART FASTFLEX adhesive keeping the

final bed thickness to the minimum that the tile and floor will allow, ideally a 3-4 mm final bed thickness beneath the tiles.

Alternatively BAL RAPID MAT can be installed using a BAL rapid setting/flexible adhesive in line with BAL recommendations.

Note: For current material, function and installation guidance, please refer to the BAL RAPID MAT Technical Datasheet.

1. Fixing of Tiles to an Overlaid Timber Floor (Method 1)

For rigid and deflection free overlaid timber floors; BAL SINGLE PART FLEXIBLE, BAL MAX FLEX FIBRE, BAL RAPIDSET FLEXIBLE FIBRE, BAL STONE & TILE PTB or BAL SUPERCOVER RAPID FLEX adhesive can be used directly. Tiles may be laid in a 3-6 mm solid bed of adhesive, ensuring no voids are left beneath the tiles. Levelling can be carried out using BAL LEVEL MAX.

Note: Installation of BAL RAPID MAT may also be considered for floors where there is undertile heating installed as further protection from thermal movement. BAL RAPID MAT is not an alternative for movement joints.

GROUTING

Once the adhesive selected has fully cured and dried (Observing setting times), joints at a minimum of 3 mm wide between the tiles may be filled with the following grouts:

Method 1

BAL SUPERFLEX WIDE JOINT GROUT
BAL MICROMAX2

Method 2 & 3

BAL WIDE JOINT GROUT with BAL ADMIX GT1 (at a 1:1 dilution by volume with water).
BAL MICROMAX2 GROUT with BAL ADMIX GT1 (at a dilution of 2 parts water with 1 part BAL ADMIX GT1 by volume).

Check for any potential risk of staining of tiles. Consideration should be given to the use of BAL PROTECTIVE SEALER prior to grouting especially with porous type tiles.

MOVEMENT JOINTS

Once tiling commences movement joints should be incorporated so as to extend from the base through to the tiled floor finish. Placement and location of joints should be installed in accordance with BS 5385: Part 3 - 2014. Movement joints should be incorporated at all perimeters and upstands.

- Over existing and/or structural movement joints.

- Over junctions between different base materials.
- Over supporting walls and beams.
- In non-heated large floor areas, the tiling should be divided into bays measuring 10 m x 10 m.
- Joints to be at least 6 mm wide and extend through tiles and bedding to the base.
- Joints located over existing structural movement joints should extend through any intermediate substrate and be the same width or greater than the joints below.

Note: For suspended floors or areas which might be subjected to significant thermal changes, i.e. direct sunlight in atria, or under-floor heating etc, the floor area should be divided up by movement joints into bays of size not greater than 40 m² with an edge length not greater than 8 m.

In shower areas/wet rooms the floor should be tanked. This is to ensure no passage of water to the underlying substrates. This may be achieved using BAL WP1 TANKING SYSTEM or BAL TANK IT

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TECHNICAL ADVISORY SERVICE

For free expert guidance on the use of BAL products, or any aspect of ceramic tiling contact the Technical Advisory Service department on:
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NOTE

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