Breathable Insulated Lime Floors

Breathable Lime floors offer an alternative to cement concrete floors as well as providing good insulation values.

In new build construction the DPM run under the walls as well as the floor, in refurbishment of old buildings DPM should be avoided because they finish at the base of the walls at the perimeter of the floor resulting in concentrations of moisture at these points which can lead to an increase of rising dampness in the walls.

A lime floor is made up of three layers.
1. Free draining sub-base.
2. Lime concrete slab
3. Lime screed which can contain Underfloor heating.
4. Sub-bases consisting of TECHNopor® PERIMETER 50 foamed recycled glass, which prevent water from rising in the walls along with providing a much better thermal performance.

Unilit Lime screeds can be made to be waterproof, but at the same time permeable to water vapour. They ensure the passage of water vapour between the floor and the interior. Where rising damp is expected to occur this can freely evaporate through the lime screed preventing the build-up of a hydrostatic pressure within the floor or building structure. The low salt content of the binder, as well as its permeability to water vapour eliminates all risk of efflorescence (salts) after the surface of the finished screed or the tiled flooring has dried.
Lime Floors – Advantages

Lime floors can provide major benefits to older traditionally built construction when used as an alternative to DPM & cement concrete floors. By using Lime as the binder in a floor slab and screed the floor is allow permeable to water vapour “breathe” which prevents the build-up of moisture subsequent movement of salt laden water from travelling in to the lower parts of the adjacent walls.

Since the 1940’s many refurbishment of older properties up and down the country have had replacement cement floor slabs with DPMs installed This has moved moisture to the lower parts of the walls creating a further problem of the effects of rising dampness to the surface drying area of the wall plaster, the following lime flooring information will prevent the same from happening in the future.

*To dry out walls and tackle the effects of rising damp please see Unilit 30 stabilising plaster.*

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**Thermal improvement & Time Saving Advantages**

The lime slab can be omitted when using compacted Technopor glass foam granulates which is an insulated sub-base this can be topped with Pre-blended Unilit C screed from 65mm – 100mm which can result in a time saving. The lime screed can also be made by site mix Fen-XA NHL5 and 0-5mm well graded sharp washed sand.

**Lime screed with under floor heating**

The screed should be laid in two layers the first to the thickness of the heating pipes, approximately 25 – 30mm. To provide suitable reinforcement stainless steel wire mesh reinforcement (approx. 5cm spacing) is recommended to be laid into the screed (to absorb the thermal stresses in the flooring due to the heating system) and the second layer of screed applied over the mesh a minimum 30mm thick. Greater thickness can be applied up to 100mm total thickness for the two layers. Following layers or bedding layers should be applied 7 to 10 days after application.
TECHNOpor® is glass foam granulate (glass foam gravel) this is the ecological alternative for insulation to building floors.

Technopor® Perimeter 50 is a lightweight, breathable aggregate made from recycled glass is capable of being used as a load bearing hardcore and has better lambda value than alternatives so needs less depth for the same thermal performance. Technopor® Perimeter 50 has a Lambda thermal performance of around 0.08 it is very stable and is load bearing with an exceptional compressive strength of approximately 500kn/ m². The grain sizes are 30 - 50mm granules which require to be compacted by Vibrating plate compactor where being used as flooring, 30% extra volume should be allowed for when calculating for a compacted application.

The properties of TECHNOpor® are as follows:

Structural Ability
- The lattice structure creates a high compressive strength @ 500 kN/m².

Drainage
- The uniformed grain size and no fines create the highest degree of drainage capacity without causing settlement to the building or slab.

Inert
- Meets the highest standard for inert building material. Leaching tests did not show any adverse effects.

Fire Resistance
- In compliance with Euro Class A1 sintering point above 700°C. Due to the inert properties of glass boasted by the air filled pores TECHNOpor provides excellent fire protection by preventing thermal conductivity.

Odourless
- Neither humans nor the environment are affected by the processing or the finished product.
Method of Application

Site preparation and general execution:-
Excavate to formation level and trim/remove any loose material to provide a uniform surface. Inspection/approval of formation as required.

- Install drainage system/capillary moisture barrier if required.
- Install non-woven geotextile 150gm/m2 separation membrane which is to be wrapped up the edges of the completed TECHNOpor® PERIMETER 50 installation and lapped with the surface geotextile – see below.

- Install TECHNOpor® PERIMETER 50 - see below for placing and compaction requirements.

Placing & compaction requirements of TECHNOpor® PERIMETER 50

- Placing in the work area is undertaken by dumper or wheel barrow and simply, easily and quickly spread to the required loose thickness by hand using rakes.
- Compaction ratio i.e. loose to compacted state 1.3:1.
- Minimum compacted thickness 150mm.
- Maximum compacted layer thickness 300mm.
- For design thickness greater than 300mm, placing and compaction is to be undertaken in two or three layers.
- Maximum compacted thickness beneath floor slabs and foundations 900mm.

Typical compaction plant:-

- Vibrating plate compactor with a dead weight of 80 – 120kg
  Plate dimensions 500mm x 500mm
  Minimum number of 3 passes
When the TECHNOpor® PERIMETER 50 is compacted a further layer of geotextile is laid.

- Install non-woven geotextile 150gm/m2 to compacted surface of TECHNOpor® PERIMETER 50

Laying Lime floor

- The screed will be laid to a thickness of between 65mm and 100 mm, depending upon the loads to be applied under use and whether or not an Underfloor system of floor heating is being installed. The lime screeds are ruled flat and finished with a wood float. The laid mortar requires to be left to dry for 1 to 2 weeks, while regularly being dampened down during conditions of dry weather and high temperatures.

Finish: Wood float or lightly keyed for following layers
Reinforcement: Telling Brick Mesh or Stainless steel wire mesh reinforcement (5cm spacing) for Underfloor heating systems.

- When the screed is selected as the final finish of a floor Unilit B Fluid 2 is designed to give a tightly bound wearing screed finishing layer. This finishing layer is manufactured from a natural hydraulic lime binder with carefully selected aggregates and where required natural earth ochre pigments added on site.

The mortar and the natural ochre pigments are first dry mixed by means of a slow speed electric paddle mixer. The mortar is then mixed with clean water at a ratio of 5 – 6 litres of water to 30 kg of prepared powder again with the paddle whisk for 3 to 5 minutes. When mixed the mortar should be a creamy and workable consistency with an open time of approximately about 2 hours.

A minimum of 4 days after the laying of the base screed, and depending upon weather conditions, the adhesive layer is applied to a nominal thickness of 5mm (4 – 8mm). The tiles are laid and pushed tightly into the fresh mortar bed. Allow a drying period of 1 to 2 days to be observed before the finished tiles are walked upon. The pointing/grouting is carried out as a separate operation at a later date. Alternatively, where the same bedding and pointing mortar are to be used, the mortar can be pushed up between the tiles or stone as they are bedded and the bedding and pointing carried out in one operation.
Lime floor build-up

The lime concrete slab is made by mixing Fen-XA NHL5 and 0-20mm sand & aggregate or using pre-blended Unilit C. The lime slab can be omitted when using TECHNOpor® PERIMETER 50 as a sub-base with a lime screed which can be made with Fen-XA NHL5 and 0-5mm sharp sand or can be provided pre-blended.
Depending on the requirements the screed layer can be finished with either a final polished wearing screed or bedded stone or tile floor finish.

Underfloor heating works well with lime floors and can be laid directly in the slab or installed in the screed.

For information and advice or to discuss a suitable specification for your project, please contact Telling Lime products on 01902797700
UNILIT C Lime Concrete for Reinforced Lime wall and floor slabs

Reinforced Lime floor slab can be made by using Unilit C pre-blended lime concrete Unilit C has a

The compressive strength of around 15 N/mm² (or more, depending on the size of the aggregates that can be add to increases ).

[Graph showing compressive strength over time for different aggregates]