Editor : LT/RC/IM 10 March 2026

PRACTICAL GUIDE Installation Guide for Applying Mortar Screeds on Floors: KHOLAO® BETON (lime concrete) – Detailed Application Guide

1. Introduction

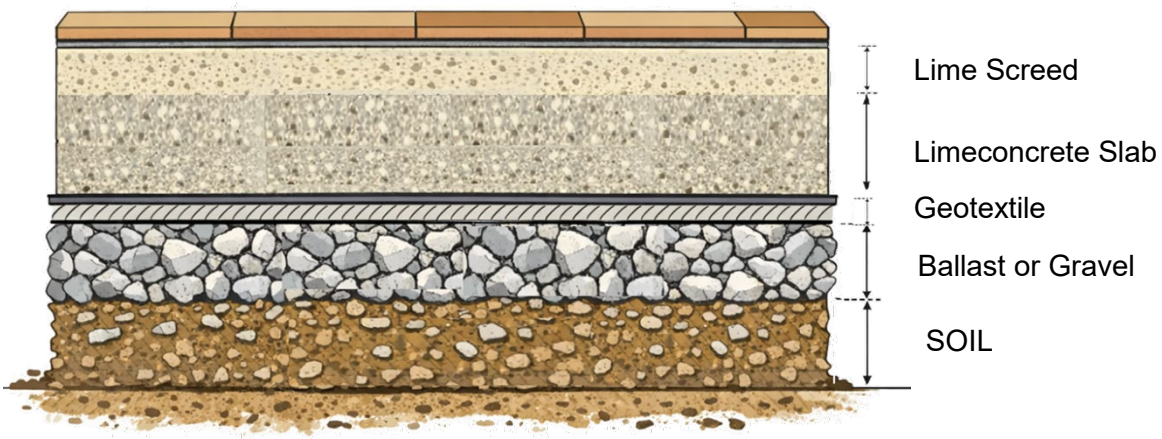
Lime concrete slab based on natural hydraulic lime are breathable, flexible, and compatible with traditional and ecological construction systems.
This system is particularly suitable for:

- Ground floors without concrete slabs
- Heritage and renovation projects
- Eco-construction and breathable floor systems

The build-up described consists of:

- Gravel base layer
- Geotextile membrane
- Lime concrete screed

2. System Build-Up: Typical Floor Section



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3. Substrate Preparation

Proper ground preparation is essential for performance and durability.

Steps:

To stabilize the soil, apply Saint-Astier® NHL 5 lime at a dosage of approximately 14 kg per cubic meter of soil. This corresponds to a proportion of 8 kg of lime for every 10 % of soil by weight.

Procedure:

1. Preparation: Excavate or loosen the soil to the desired depth.
2. Mixing: Evenly spread the lime over the soil surface. Use a rotary tiller or mechanical mixer to thoroughly incorporate the lime into the soil.
3. Moisture Adjustment: Lightly moisten the mixture to facilitate chemical reactions and improve workability.
4. Compaction: Compact the treated soil to achieve the desired density and stability.
5. Curing: Allow the stabilized soil to cure for several days. The lime reacts with soil minerals to increase strength, reduce plasticity, and improve durability.

4. Gravel Layer (Base Layer)

- Use clean gravel 0/25mm or bigger, they need to accomplish to EN 13242
- Spread evenly over the prepared ground
- Compact thoroughly (≈ 95% Proctor equivalent)

This layer ensures:

- Load distribution
- Drainage
- Capillary break

5. Geotextile Membrane

A nonwoven geotextile is placed over the gravel layer.

Functions:

- Prevent migration of fines
- Maintain permeability
- Avoid loss of lime binder into the base

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Installation:

- Lay continuously over the gravel
- Overlap joints by minimum 50 cm

6. Lime Concrete Screed

Dosage

400 kg of lime binder per m^3 of gravel (0/16)

7. Mixing

Water Content

- Approx. 14 L of water per 25 kg of lime binder
- Adjust depending on moisture content of aggregates

Procedure

- Add gravel into the mixer
- Add lime binder
- Mix dry until homogeneous
- Gradually add water
- Mix until achieving a “damp earth / wet sand” consistency

The mix must:

- Be workable
- Not be fluid
- Hold shape when compacted
- The slump of the limecrete shall be 15 cm, as determined by the Abrams cone (slump cone) test, meaning that when the fresh mix is placed in the standard cone mould and the cone is lifted, the material must settle and subside to a height reduction of 15 centimetres. This ensures the limecrete has the required workability for proper placement, compaction, and finishing, while still maintaining its intended mechanical properties and consistency for construction

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8. Application Procedure

8.1 Placement

- Place lime concrete directly over geotextile
- Distribute evenly using shovels or rakes
- Avoid segregation

8.2 Levelling

- Use screed bars or straightedge
- Maintain uniform thickness

8.3 Compaction

- Apply light compaction only:
  - Manual tamping
  - Light vibrating screed

Tip: Avoid over-compaction (reduces porosity)

8.4 Finishing

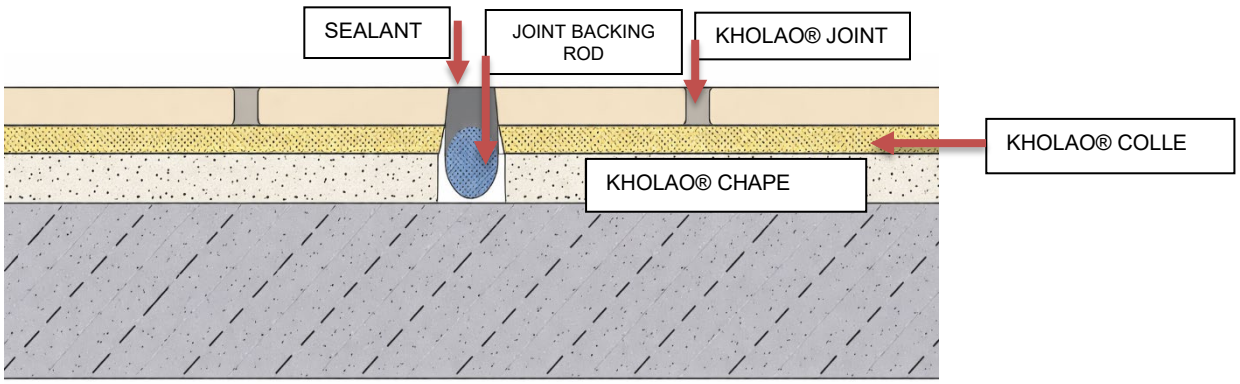
- Use wooden or metal float
- Finish according to final use:
  - Smooth finish → steel trowel
  - Textured finish → wooden float

9. Joints

9.1 Expansion Joints

- Required to control shrinkage cracking
- Maximum spacing:
  - Every 20–25 m^2
  - Or panels with ratio ≤ 1:3 (width:length)
- Depth:
  - 1/3 of screed thickness
  - Minimum 25 mm

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9.2 Perimeter Joints

- Mandatory along:
  - Walls
  - Columns
  - Fixed elements

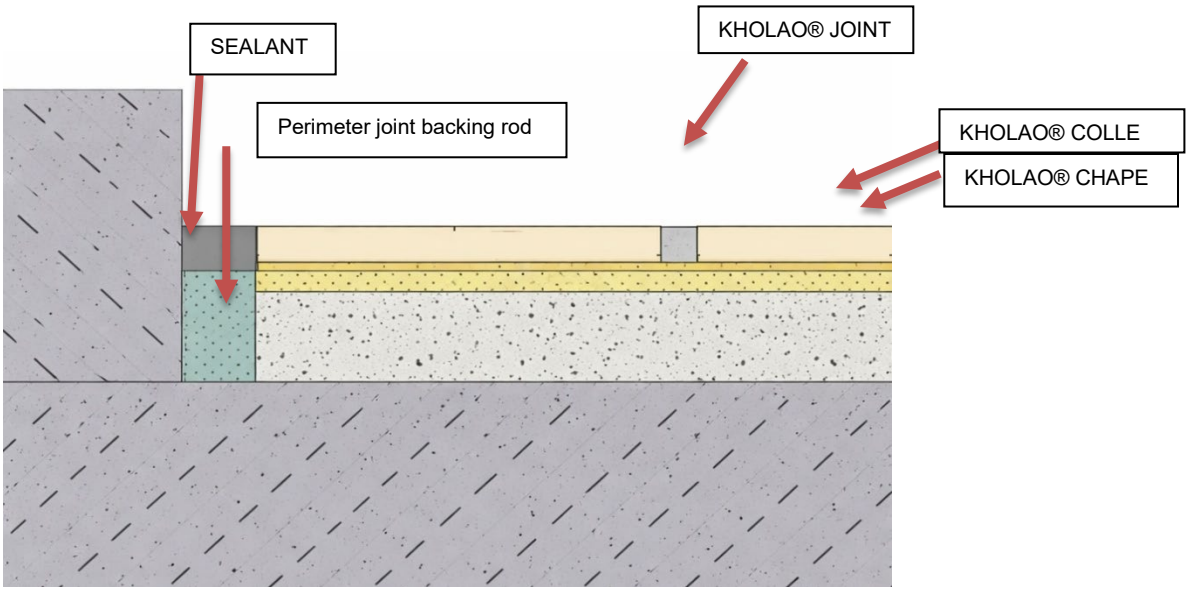
Characteristics:

- Thickness: 10–20 mm
- Material: compressible (cork, foam, XPS, etc.)

Function:

- Allow movement
- Prevent cracking due to restraint

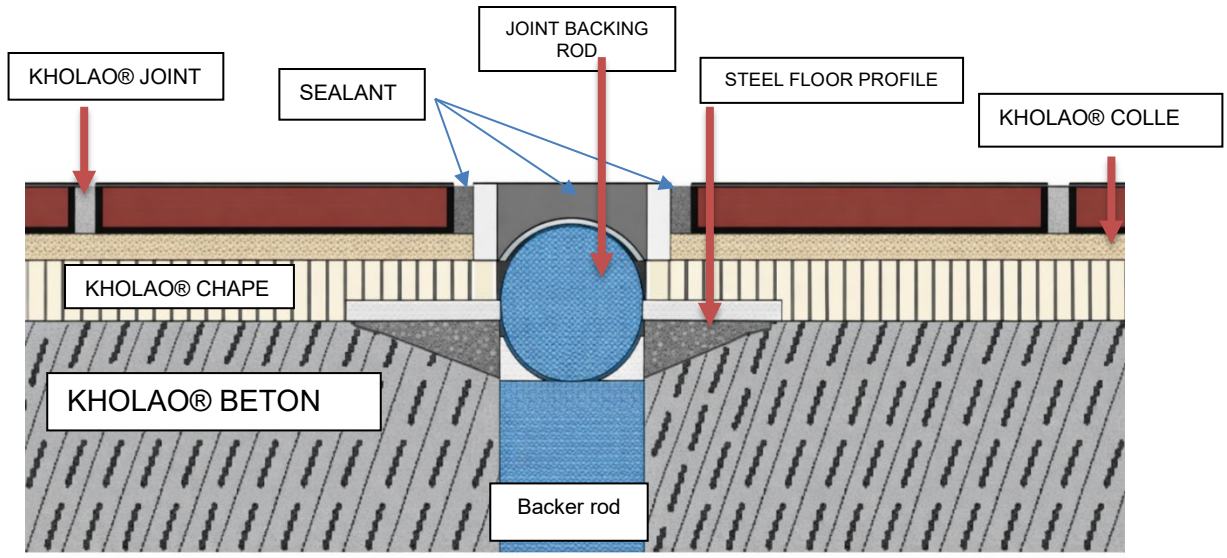
Silicone-based sealants may be used, with a F.A.M. (Movement Accommodation Factor) of 20% or 25%



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9.3 Structural joints:

Structural Joints – Lime Concrete Slabs (Worksite Instructions)
Joint spacing: 20–25 m² per joint.
Slab thickness: 100–150 mm (light traffic), 150–200 mm (heavy traffic).
Joint width: 10–20 mm.
Joint depth: 1/3 of slab thickness (e.g., 50 mm for 150 mm slab).
Method: Saw-cut or use preformed joint inserts. Keep joints straight and aligned.



Typical Structural joint diagram

10. Thickness Recommendation

- Typical thickness: 10 to 20 cm depending on use and load

11. Curing and Protection

Curing should follow standard practice for screeds:

- Protect from:
  - Direct sunlight
  - Wind
  - Rapid drying
- Maintain slight moisture during early curing if necessary
- Avoid foot traffic for 7–10 days

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12. General Recommendations

- Do not apply below 8°C or above 30°C
- Ensure proper drainage in ground
- Avoid excess water in mix
- Work continuously to avoid cold joints
- Use qualified applicators

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technical_support@saint-astier.com

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