

Installation guideline DryTile Ceramic system floor

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001 Preface

This guideline defines the areas of application, the designs and the quality principles of the DryTile system flooring process. The type of execution deviates from the existing regulations and is based on the "General Building Inspectorate Approval" Z-156.610-1373 dated 27.03.2017.

To ensure the quality of the DryTile system floor, a basic investigation and application tests were carried out by the DKG expert office in July 2018. In addition to the above-mentioned AbZ, this guideline is based on the existing standards and regulations as well as the material technology and processing test series, with the knowledge gained and systematically evaluated practical results.

002 Scope of application/ areas of use

This guideline shows which basic principles must be observed in the planning and execution of a DryTile system floor.

Possible areas of application in both the private and commercial sectors include living rooms, office space, doctors' surgeries, wholesale and retail food markets, the automotive industry and production plants.

003 System description

The DryTile system flooring is a ceramic covering, which is laid as a floating construction on new or existing subfloors. The system is laid loosely on the prepared subfloor, i.e. without the addition of adhesives or other materials that would create a non-positive bond between the two building materials. In this respect, it is a new, innovative method for the production of ceramic floor coverings as an alternative or supplement to the classic thin- or medium-bed gluing process.

004 Load bearing substrate

Possible substrates according to the AbZ are solid, mineral building materials/components (gross density $\geq 1350\text{kg/m}^3$) as well as wood and wood-based materials ($\geq 10\text{mm}$, gross density $\geq 475\text{kg/m}^3$).

In addition, the substrate may only deform to a limited extent and must be able to bear the loads without damage. For this purpose, it must be checked in advance whether the required compressive strength is sufficient. This can be checked by sampling the existing floor (at least 3 drill holes in a ca.- \emptyset of 70 mm). The required compressive strength class of the substructure depends on any applicable regulations for the respective area of application, or on contractually specified properties such as a BBS or performance description.

The surface must not have any impurities, short elevations or depressions. The design is based on DIN 18202 "Tolerances in building construction".

As is generally the case with large format tiles, the flatness tolerances in Table 3, line 4 may not be sufficient. In particular, small depressions or point elevations must be levelled out by troweling and/or sanding in order to achieve a largely flat support for DryTile.

In the case of large surface unevenness, levelling using suitable, self-levelling compounds is preferable. If there is a mechanically higher load (e.g. in food retail trade), an additional distance of 2 mm over a length of 2 m must be observed.

All substructures/components in contact with the ground must be sealed on the outside in accordance with DIN 18533. If DryTile is laid directly on top of an internal waterproofing, this must also have a surface evenness as described above.

005 Construction site conditions

The DryTile system floor may only be laid if the lowest temperatures of the substrate and the materials to be used are not below + 5°C. At temperatures above + 20°C, the processing times of the system joint are reduced. Damaging effects of the weather due to precipitation, draughts and direct sunlight must be prevented (in accordance with the cement data sheet Betontechnik B8 42.014).

006 Processing and technical information

Relocation:

Before laying the DryTile system floor, the laying direction and angle must be determined. The joint width is defined by the cork protrusion on all sides. When laying the system panels in rows, care must be taken to ensure that there are no gaps between the individual panels or their cork edges.

Wall connection plates and fitting pieces on flanking components should be laid with a minimum distance of 8 - 10 mm, in accordance with applicable standards and regulations.

Movement joints:

Movement joints are designed to absorb deformations of the flooring structure, e.g. caused by thermal expansion.

The following terms distinguish the type of joints:

-connecting joints/edge joints:

Are to be carried out on flanking building components such as walls or other covering materials.

-field boundary joints:

Joints within contiguous surfaces which limit the covering (e.g. due to thermal stress/expansion). If field boundary joints have been created in the subfloor (e.g. screed) by individual working/concreting sections, these do not need to be continued directly in the DryTile System floor, provided no height offsets are to be expected.

Due to the "floating" installation and the small part of the shrinkage deformation, considerably larger fields can usually be realized, which are particularly dependent on the expected mechanical and thermal stress.

The aspect ratio is usually not more than 1:1.5.

-building separation joints :

Building separation joints are statically required joints between two different parts of a building to compensate for different expansions or possible subsidence of building components.

They must be taken over through all components at the same place and in the same width. The design (if necessary with expansion profiles) depends on the use of the floor and must be specified by the planner or agreed with him.

The movement joints are considered maintenance joints.

When using "box profiles" made of plastic or metal, a flank break of the joints towards the profile cannot be avoided due to the construction.

Grouting:

The system floor may only be grouted with the corresponding DryTile system joint. The overall strength of the floor (creating a disc-shaped construction) is due to the enormous flank adhesion of the joint to the system panel.

The processing properties of the DryTile system joint are similar to those of a conventional, cementitious joint.

The following execution rules must be observed:

Mix the dry system joint:

Single-component jointing mortar based on DIN EN 13888 "Jointing mortar for tiles and slabs".

When mixing, it is essential to ensure that the mixing ratio of dry mix to mixing water is maintained in order to avoid over-watering or "burning" (heat of hydration) of the mortar. Mixing must be carried out with a suitable stirring / mixing tool (mortar whisk). Mixing time at least 3 minutes, then apply directly.

Mixing ratio:

Dry mix	Mixing water
System joint [kg]	[ml]
1,00 kg	150 ml

Processing time approx. 20 min. at + 23°C and 50% relative humidity.

Higher temperatures shorten, lower temperatures lengthen the processing times.

Processing:

The jointing mortar is worked into the joints with a special rubber jointing board. Care must be taken to ensure that movement joints are completely freed of residual material. Allow the mortar in the joint to be matt. Caution The material must be pre-washed / emulsified quickly (example: at a temperature of +23°C within 3 minutes).

Pre-wash the stripped material with a slightly damp sponge board. Rewashing should remove all residual joint material on the flooring and clean it without leaving any residue. The washing water for the re-washing process should be changed several times to avoid veils on the surface. Afterwards, make sure that the system joints remain dry. As work progresses, washing water can get onto surfaces that are still to be grouted; this must be completely removed from the joint chambers before applying the grout.

Commissioning/loading after manufacture:

After grouting, the surface of the DryTile System flooring requires a hardening time of 12 h (at a minimum temperature of + 15 °C).

During this time, the floor must not be loaded so as not to disturb the setting process.

The floor can then be loaded on foot, with ladders and light working and protective scaffolding (max. load class 2). After 24 h (at min. +15°C) the floor is fully loadable.

All times are dependent on the ambient temperature. Do not use below +5°C and not above +30°C without special measures.

007 Quality assurance

The DryTile system flooring is laid exclusively by certified specialist companies, which are bound by the applicable standards and regulations, especially in terms of execution.

Sets of rules:

- DIN 18352 Tiles and slab work
- DIN 18202 Tolerances in building construction, table 3

The overall acceptance of the system floor should take place shortly after completion in order to be able to clearly assign possible defects (manufacturing to usage defect). Acceptance should be based on pre-defined criteria (in particular the points listed below).

Surface evenness:

The acceptance inspection is carried out under sufficient lighting conditions (approx. 300 lx) without grazing light. With regard to the surface evenness of the finished floor, DIN 18202 table 3 line 3 column 2-6 must be observed.

Height differences ("overtoothing"):

With regard to height differences between adjacent tile edges/elements, the ZDB Code of Practice "Height differences" shall be applied, in particular the regulations of section 1.1 "Claddings and coverings of ceramic tiles and slabs" shall be observed.

Deviating from this, DryTile takes into account the tolerances of the substrate and material-specific tolerances of the tiles/tiles.

According to the ZDB bulletin, unevenness or height offsets that become visible under the influence of grazing light do not constitute a defect, provided that the tolerances specified therein are observed. If permanent glancing light prevails due to usage (e.g. due to floor-

level external windows, glass doors or similar), special requirements for the installation must be agreed.

Joint pattern:

The displacement of the joint pattern must not exceed the limit value of 4 mm for reference lengths of 1 m, 4 mm for a reference length of 4 m and 12 mm for a reference length of 10 m.

Adhesive bond:

If the adhesive bond between the system plate and the joint is to be determined, a confirmation sample must be taken from the existing floor. Confirmation samples are not required. The following adhesive bond values between tile and joint must be obtained: Nominal strength 1.0 N/mm² / smallest single value 0.50 N/mm² (based on DIN EN 12 004 and DIN EN ISO 13007 Part 1)

Use of the system floor:

After commissioning and use of the floor by industrial trucks, the floor is subjected to a separate stress (pressing by load transfer as point load).

The contact area of the tyre must be assessed differently depending on the type of tyres.

With regard to the stress on the ground, the decisive factor is not the frequency of use, but the axle load in conjunction with the type of tyres.

In accordance with the stress groups according to DIN 18560 Part 7, only one tyre should be used, polyurethane elastomer (Vulkollan), rubber, elastic and pneumatic tyres for use on the ground. Polyamide rollers appear critical, steel tyres are excluded from use on the DryTile System floor.

008 Possible applications

The DryTile floor system can be used on all horizontal surfaces. Exceptions are stairs and inclined levels. The DryTile system floor cannot be used in wet areas with water exposure classes according to DIN 18534 or in outdoor areas.

The installation system cannot be used on wall surfaces either.

009 Connections to the DryTile system base

Height-adjusted connections to the DryTile system base:

The connection between the DryTile system floor and existing or newly created building components is carried out as described under item 006 Processing and execution instructions => Movement joints. Differences in height between the system floor and the existing surfaces can be created with conventional thin-bed bonding or with prefabricated metal ramp profiles.

Fixings on/through the system base:

A non-positive connection of the DryTile system floor with the substrate or penetrating components (clamping) must be avoided. A sliding function would otherwise be impossible in this area.

Penetrating fastenings must therefore be made "contact-free", e.g. with spacers.

010 List of standards/regulations

Standards

DIN 18352

Tiles and slab work

DIN 18202

Tolerances in building construction

DIN 18534

Sealing of interior spaces

DIN EN 12004

Mortars and adhesives for tiles

ISO 13007 Part 1

Ceramic tiles - mortars and adhesives

DIN 18560 part 7

Screeds in building applications - Part 7: Heavy-duty screeds (industrial screeds)

Leaflets

Cement data sheet Concrete Technology B8 42.014

Published by: Informations-Zentrum Beton GmbH, Steinhof 39, 40699 Erkrath;

www.beton.org

ZDB Instruction Sheet Movement joints

Publisher: Professional Association for Tiles and Natural Stone in the ZDB e.V., Berlin

ZDB Instruction Sheet Height differences

Publisher: Professional Association for Tiles and Natural Stone in the ZDB e.V., Berlin

Errors excepted

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