

Installation Guideline DryTile Ceramic System Floor

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001 Preface

This guideline defines the areas of application, designs and basic quality principles of the DryTile system floor method. The type of design is done differently from existing regulations and is based on the “General building supervisory approval” Z-156.610-1373 from 29-03-2019.

A general investigation and application related tests were carried out for quality assurance of the DryTile system floor. The basis of this guideline is, in addition to the above-mentioned general building supervisory approval, the existing standards and regulations as well as the material and processing related series of tests, with the knowledge gained from them and systematically evaluated practical results.

002 Scope / Areas of application

This guideline indicates which basic principles in the planning and execution of a DryTile system floor must be complied with.

Possible areas of application in the private and commercial area are, for example, living spaces, office areas, wholesale and retail food markets, automotive areas and production plants.

003 System description

The DryTile system floor is a ceramic flooring, which is laid as floating construction on new or existing subfloors. The system is laid loose on the prepared subfloor, that is without adding adhesives or other substances, which creates a solid bond between the two construction materials. It is in this respect it is a new, innovative method for making ceramic floor surfaces.

004 Load bearing subfloor

Possible subfloors complying with the general building supervisory approval are solid mineral construction materials/components (bulk density $\geq 1350\text{kg/m}^3$) as well as wood and wood materials ($\geq 10\text{mm}$, bulk density $\geq 475\text{kg/m}^3$).

Furthermore, the foundation may only deform to a limited extent and must withstand the occurring loads without damage. For this it must be checked in advance as to whether the required compressive strength is sufficient. This can be checked using a sampling of the existing floor (min. 3 bores in a \varnothing of approx. 70 mm). The required compressive strength of the subfloor is dependent upon possible applicable regulations for the respective area of application or upon contractually established properties, for example a general building supervisory approval or description of performance.

When laying on existing tile surfaces, they must be checked for hollow layers, e.g. by tapping on the old tile flooring, breaks or cracks.

The surface must not have any dirt, short ridges or cavities. The subfloor must be checked using a straight edge or an electronic floor laser for ridges or cavities. DIN 18202 "Tolerances in building construction" applies as the basis for the measurement.

As is principally the case with large format tiles and slabs, the surface level tolerances of Table 3, line 4 are possibly not sufficient. Especially small-scale depressions or point bumps must be evened with a spatula and/or sanding, in order to achieve the most even surface overlay of DryTile possible.

For large-scale unevenness, leveling the use of a suitable self-flowing leveling compound, which matches the respective subfloor, is preferred. Prior flat surface or point sanding of ridges has been tried and tested.

If there is higher mechanical loading (e.g. in the food retail trade), an additional dimension of 2mm to a length of 2m must be maintained here.

All ground contacting substructures/components must be sealed on the outside according to DIN 18533. If DryTile is laid directly on an internal seal, this must also have a surface evenness as previously described.

005 Site conditions

Laying of the DryTile system floor must only be done when the lowest temperatures of the subfloor and the material to be used are not below + 5°C. For temperatures of + 20°C and above, the processing time of the system joint is shortened. Damaging weather influences from precipitation, drafts and direct sunlight must be prevented (in compliance with the cement information sheet Concrete Technology B8 42.014).

In principle, the subfloor to be covered with DryTile should be free of dust and dirt.

006 Processing and operational related instructions

Installation:

The installment direction and angle must be established before installation of the DryTile system floor. The joint width is defined by the cork protrusion. During installation of the system slabs in rows, it must be ensured that there are no gaps between the individual slabs or their cork edges. Irregularities in the respective rows must be evened out.

Wall connection slabs and fitting pieces on flanking components should be laid with a minimum spacing of 8 - 10 mm, in compliance with the applicable standards and regulations.

Expansion joints:

Expansion joints are implemented to accommodate deformations of the flooring construction, which, for example, result from thermal expansion.

The following terms differentiate the type of joints:

- **Connection joints/edge joints:**
Are to be implemented on flanking components, e.g. walls or other flooring materials
- **Field boundary joints:**
Joints within connecting surfaces, which restrict the flooring (e.g. due to thermal stress/expansion). If field boundary joints are laid in the subfloor (e.g. in an attic or tile flooring) by individual work / casting sections, these must not be continued directly in the DryTile system floor, as long as no height offsets are expected. However, it can be practical, depending upon the on-site conditions, for the field boundary joints to be done at almost the same place, e.g. by shifting the expansion joint in the next following joint of the complete tile.
If the subfloor is made of a leveling paste that must be introduced later, this must be separated in the area of the expansion joint in the old flooring. If no expansion joints are present in the old subfloor, the arrangement and dimensioning of the expansion joints must be done according to the current valid ZDB information sheet.

The cork protrusion from DryTile must be removed in the area of the expansion joints.

To prevent a three-point adhesion of the sealing compound, the joint must be prefilled using suitable, flat joint tape.

Through the “floating” installation and the low amount of shrinkage, significantly larger fields can as a rule be realized, which are especially dependent on the expected mechanical and thermal load and the allowable total deformation of the sealing compound. The specifications of the ZDB information sheet are to be followed in this respect.

The side ratio as a rule is not over 1:1.5.

- **Building expansion joints:**
Building expansion joints/construction expansion joints are statically required joints between two different building structures for balancing different expansions or possibly settling of components.
They must be taken through all components at the same location and in the same width. The execution (possibly with expansion profiles) depends on the use of the floor and must be specified by the planner or agreed upon with the planner.

The expansion joints are considered maintenance joints.

When using “box sections” made of plastic or metal, a flank tear of the joint up to the profile is unavoidable due to the design. The leg of ready-made joint profiles must be worked into the subfloor flush with the surface.

Grouting:

Grouting of the system floor must only be done with the associated DryTile system joint. The entire strength of the floor (creating a disk-shaped design) results from the enormous flank adhesion of the joint to the DryTile system tile.

The following execution rules must be followed:

Blending the dry system joint:

One-component grout in compliance with DIN EN 13888 “Grout for tiles and slabs”.

During blending care must absolutely be taken so that the mixture ratio of dry mixture to mixing water is complied with, to prevent overwatering or “burning” (hydration heat) of the grout.

Mixing must be done with a suitable stirring/mixing tool (grout whisk). Mixing min. 3min., afterwards directly process.

Mixing ratio:

Dry mixture	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 the processing times, lower temperatures lengthen them.

Processing:

The grout is worked into the joints with a special rubber jointing board with sharp strip edges. Make sure that the system joint compound is applied completely fully into the joint. A diagonal stripping with simultaneous pressing of the DryTile system joint compound has been tried and tested. Furthermore, it must be ensured that expansion joints are completely free of residual material.

Residues of the system joint compound on the flooring surface must be immediately emulsified using a slightly damp sponge board and quickly pre-washed.

The washing following this should loosen all residual material of the joint from the flooring and clean without residue. The washing water for the after-wash process must be changed frequently, to prevent smears on the surface. During after-washing a diagonal running washing process to the joint/tile has also been tried and tested. During the hardening time pay attention that the joined surface is not walked on or loaded.

Afterwards, make sure that the system joints remain dry. During continuing work, wash water can get onto surfaces yet to be joined, which must be removed completely from the joint chambers before applying the joint compound.

Start-up/loading after execution:

The flooring surface of the DryTile system floor requires a hardening time of 12 hr after jointing (at a minimum temperature of + 15 °C).

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

Afterwards the floor can be loaded by walking and with ladders and light work and protective scaffolds (max. load class 2). After 24 h (at min. +15°C) the floor can be loaded.

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

007 Quality assurance

The laying of the DryTile system floor in commercial areas is only done by certified specialized companies, which are especially bound to the applicable standards and regulations.

Regulations:

-- DIN 18352 Tile and slab work

-- DIN 18202 Tolerances in building construction, Table 3

The overall acceptance of the system floor should be done shortly after completion, in order to clearly assign possible deficiencies (manufacture to use deficiency).

Acceptance should be done based on prior established criteria (especially the following named points).

Surface evenness:

The acceptance inspection is done with sufficient light conditions (approx. 300 lx) without light streak. In regards to the surface evenness of the finished floor, DIN 18202 Table 3 Line 3 Column 2-6 must be complied with.

Height differences (“surfaces not flush”):

In regards to height differences between adjacent tile edges/elements, the ZDB information sheet “Height differences” is to be used, especially the regulations of Point 1.1. “Facings and floorings from ceramic tiles and slabs” must be complied with.

In contrast, with DryTile the tolerances of the subfloor and material-specific tolerances of the tiles/slabs are taken into consideration.

Unevenness or height offsets visible under light streak influence do not present a deficiency according to the ZDB instruction sheet, as long as the tolerances mentioned there are complied with. If usage-dependent continual light streak prevails (e.g. by floor depth exterior window, glass doors, etc.), special requirements are to be agreed upon for the installation.

Joint appearance:

Moving of the joint pattern with reference lengths of 1 m may not exceed the limit value of 4 mm, for a reference length of 4 m and for a reference length of 10 m, may not exceed the limit value of 12 mm.

Adhesive bond:

If the adhesive bond between the system slab and the joint should be determined, a confirmation sample is to be taken from the existing floor. Retention samples are not required. The following adhesive bond values between tiles and joints must be achieved: Nominal strength 1.0 N/mm² / smallest single value 0.50 N/mm² (in compliance with DIN EN 12 004 and DIN EN ISO 13007 Part 1).

Use of the system floor:

After start up and use of the floor by industrial trucks, this is subjected to a stress (pressing due to load transfer as point load).

The contact area of the tires is to be assessed differently depending on the type of tires.

Taking into account the stress on the floor, it is not the frequency of use that is critical, but rather the axle load in combination with the type of tires.

Taking into account the stress groups according to DIN 18560 Part 7, only one type of tires made of polyurethane-elastomer (Vulkollan), rubber, elastic and air tires should be used on the floors. Polyamide rollers seem critical, steel tires are excluded from use on the DryTile system floor.

008 Application options

The DryTile floor system can be used on all horizontal surfaces. Stairs and ramps are an exception. The DryTile system floor cannot be used in wet areas with water influence classes according to DIN 18534 and in outside areas.

The laying system also cannot be used on wall areas.

009 Connections to the DryTile system floor**Level connections to the DryTile system floor:**

The connection between the DryTile system floor and existing or newly installed components is done as under point 006 Processing and operational related instructions => Describing expansion joints. Height differences between the system floor and the existing surfaces can be made with a conventional thin bed adhesion, or with pre-fabricated metal ramp profiles.

Fastening on/through the system floor:

A solid connection of the DryTile system floor with the subfloor or penetrating components (clamping) is to be avoided. A sliding function is otherwise excluded in this area.

Penetrating fastenings are therefore to be made "contact free", e.g. with distance spacers.

010 Directory of standards/regulations

Standards

DIN 18352

Tile and slab work

DIN 18202

Tolerances in building constructions

DIN 18534

Sealing of interior spaces

DIN EN 12004

Grout and adhesives for tiles and slabs

ISO 13007 Part 1

Ceramic tiles – Grout and adhesives

DIN 18560 Part 7

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

Information sheets

Cement information sheet Concrete technology B8 42.014

Publisher: Informations-Zentrum Beton GmbH, Steinhof 39, 40699 Erkrath, Germany;

www.beton.org

ZDB-information sheet Expansion joints

Publisher: German tile and natural stone association in the ZDB e.V., Berlin

ZDB-information sheet Height differences

Publisher: German tile and natural stone association in the ZDB e.V., Berlin

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Please also watch the associated training film on installation guidelines

“**Correctly installing DryTile**” under the following QR Code at:

