Technical Data Sheet DT01

DryTile
Ceramic system floor

Valid as at: October 2023

Contents:

001 Foreword

This guideline defines the areas of application, the designs and the quality principles of the Dry⊥ile system flooring method. The type of execution deviates from the existing regulations and is based on “General building approval” Z-156.610-1696 in the version dated 06.02.2022.
For quality assurance of the Dry⊥ile system floor, a basic investigation and technical application tests were carried out. In addition to the general building approval referred to above, this guideline is based on the existing standards and regulations as well as the material technology and processing technology test series, with the resulting findings and systematically evaluated practical results. The installation of Dry⊥ile system flooring in commercial areas may only be carried out by certified specialist companies. This is not a mandatory requirement in private and residential areas.

002 Scope / Areas of application

This guideline outlines the basic principles that must be observed when planning and installing a Dry⊥ile system floor.
In addition to private areas and living spaces, potential areas of application include commercial areas such as offices, doctors’ surgeries, wholesale and retail food outlets, automotive areas, showrooms and production facilities.

003 System description

The Dry⊥ile system floor is a ceramic floor covering that is laid as a floating construction on new or existing substrates. The system is laid loosely on the prepared substrate, i.e. without the addition of adhesives or other substances that would create a force-fit bond between the two building materials. In this respect, it is a new and innovative method for laying ceramic floor coverings.

004 Load-bearing substrate

Possible substrates in accordance with general building approval Z-156.610-1696 dated 06.02.2022 are solid, mineral building materials/components (gross density ≥ 1350 kg/m³) as well as wood and wood-based materials (≥10 mm, gross density ≥ 475 kg/m³).
In addition, the substrate may only deform to a limited extent and must be able to bear the resulting loads without damage. To this end, it may be necessary to check in advance whether the required compressive strength is sufficient. This can be checked by sampling the existing floor (at least 3 drill holes with an approx. diameter of 70 mm). The required compressive strength class of the substructure depends on any applicable regulations for the respective area of application, or on properties stipulated by contract such as a construction or performance specification.

When laying on existing tile coverings, check for voids, e.g. by tapping off the old tile covering, and for chipping or cracks.

The surface must not display any soiling, short elevations or depressions. Use a levelling rod or an electronic floor laser to check the substrate for elevations or depressions. DIN 18202 “Tolerances in building construction” applies as the basis for dimensioning.

As is generally the case with large-format tiles and slabs, the evenness tolerances in Table 3, line 4 may not be sufficient. Small depressions or localised elevations in particular should be levelled out by filling and/or sanding in order to achieve a largely flat surface for Dry⊥ile.
In the case of unevenness across larger areas, levelling using a suitable self-levelling compound matched to the respective substrate is preferable. Prior sanding of uneven areas, either flat or in spots, has proven effective.
If there is a higher mechanical load (e.g. in food retailing), an additional 2 mm tolerance must be maintained over a length of 2 metres.
All substructures/components with ground contact must be sealed on the outside in accordance with DIN 18533. If Dry⊥ile is laid directly on an internal seal, this must also have a surface evenness as described above.

005 Construction site conditions

Dry⊥ile system flooring 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 + 23 °C, the processing times of the system joint are shorter. Damaging weather effects caused by precipitation, draughts and direct sunlight must be prevented (in accordance with the cement data sheet “Cement technology B8”, issue 4/2014).

The substrate to be covered with Dry⊥ile should always be free of dust and impurities.

006 Processing and installation instructions

Installation:
Before laying the Dry⊥ile system flooring, the laying direction and angle must be determined. The joint width is defined by the cork overhang on all sides. When laying the system tiles in rows, make sure that no gaps form between the individual tiles or their cork edges. Irregularities in the corresponding rows must be levelled out.
Wall connection tiles and fitting pieces on flanking components should be laid with a minimum spacing of 8-10 mm in accordance with applicable standards and regulations.

Expansion joints:
Expansion joints are designed to absorb deformations of the flooring structure caused by thermal expansion, for example.

The following terms differentiate between the types of joints:

- Connection joints/edge joints:
  To be carried out on flanking components such as walls or other covering materials

- Field boundary joints:
  Joints within contiguous surfaces that limit the covering (e.g. due to thermal stress/expansion)
  If field boundary joints have been created in the substrate (e.g. screed or tiling) by individual working/concreting sections, these do not have to be continued directly in the Dry⊥ile system floor, provided no height offsets are to be anticipated. However, depending on the local conditions, it may be advisable to continue the field boundary joint in almost the same place, e.g. by relocating the expansion joint to the next joint of the full tile.
  If the substrate consists of a levelling compound that has been applied subsequently, this must be separated in the area of the existing expansion joint in the old floor covering. If there are no expansion joints in the old substrate, the expansion joints should be arranged and dimensioned in accordance with the currently valid ZDB data sheet.

  The cork overhang from Dry⊥ile must be removed in the area of the expansion joints. To avoid three-sided adhesion of the sealant, the joint must be pre-filled using a suitable, flat joint tape.

  Due to the “floating” installation and the small amount of shrinkage deformation, significantly larger areas can generally be realised, which depend in particular on the anticipated mechanical and thermal stress and the permissible total deformation (ZGV) of the sealant. The specifications of the ZDB data sheet on expansion joints must be observed in this respect.
  As a rule, the aspect ratio should not exceed 1:1.5.

- Building separation joints:
  Building separation joints/construction separation joints are structurally required joints between two different building components to compensate for different expansions or possible subsidence by building components.
  They must be adopted through all building components at the same point and in the same width. The design (possibly with expansion profiles) depends on the use of the floor and must be specified by and/or agreed with the planner.

The expansion joints are regarded as maintenance joints.
When using “box profiles” made of plastic or metal, the design means that it is not possible to prevent the edges of the joints from tearing towards the profile. The sides of finished joint profiles must be worked into the substrate flush with the surface.

<u>Grouting:</u>
The system floor may only be grouted using the corresponding Dry⊥ile system joint. The entire strength of the floor (creation of a disc-shaped construction) is created by the enormous side adhesion of the joint to the Dry⊥ile system tile.

The following installation rules must be observed:

Mixing the dry system joint:
Single-component joint mortar in accordance with DIN EN 13888, Grouts for ceramic tiles.

When mixing, it is essential to ensure that the mixing ratio of dry mix to mixing water is maintained in order to avoid overwatering or “burning” (hydration heat) of the mortar. Mixing must be carried out using a suitable stirring/mixing tool (mortar whisk). Mix for at least 3 minutes, then use immediately.

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 the processing times, while lower temperatures extend them. Processing must not be carried out at temperatures below +5 °C and above +30 °C without special measures being applied.

Processing:
The joint grout is worked into the joints using a special rubber jointing board with sharp edges. It is important to ensure that the system joint compound is applied fully into the joint. Diagonal levelling with simultaneous pressing in of the Dry⊥ile system joint sealant has proven successful. It is also important to ensure that all residual material is removed from expansion joints.
Residues of the system joint sealant on the flooring surface must be emulsified immediately using a slightly damp sponge board and quickly pre-washed.
The subsequent rewashing should remove all residual material from the joint on the covering and clean it without leaving any residue. The wash water for the post-wash process should be changed several times to avoid a film on the surface. A diagonal washing process to the joint/tile has also proven to be effective for post-washing.

During the setting time, it is essential to ensure that the grouted surface is not walked on or subjected to any loads.

Afterwards, ensure that the system joints remain dry. As work progresses, wash water can get onto surfaces still to be grouted; this must be completely removed from the joint chambers before the grout is applied.

Commissioning / Load after production:
The covering surface of the Dry⊥ile system floor requires a setting time of 12 hours after grouting (at a minimum temperature of + 15 °C).
During this time, the floor must not be subjected to any load, so as not to disturb the setting process.

The floor can then be walked on and loaded with ladders and light work and protective scaffolding (max. load class 2). After 24 hours (at a minimum of +15 °C), the floor offers full load-bearing capacity.

All times depend on the ambient temperature and ambient conditions.

007 Quality assurance

The installation of Dry⊥ile system flooring in the commercial sector is carried out exclusively by certified specialist companies that are bound by the applicable standards and regulations, particularly in terms of execution.

Regulations:
-·DIN 18202, Tolerances in building construction, Table 3
-·DIN 18352, Wall and floor tiling works
- DIN 18365, Flooring works

The overall acceptance of the system floor should take place shortly after completion in order to be able to clearly assign any defects (manufacturing defect to utilisation 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 highlights. With regard to the surface evenness of the finished floor, DIN 18202 Table 3, line 3, columns 2-6 must be observed.

Height differences (“overtoothing”):
With regard to height differences between neighbouring tile edges/elements, the ZDB data sheet “Height differences” must be applied, in particular the regulations of 1.1 “Claddings and coverings made of ceramic tiles and slabs” must be observed.
In deviation from this, the tolerances of the substrate and material-specific tolerances of the tiles/slabs are taken into account for Dry⊥ile.

Unevenness or height offsets that become visible under the influence of highlights do not constitute a defect in accordance with the ZDB data sheet, provided that the tolerances specified therein are observed. If there is permanent spotlighting due to use (e.g. due to floor-to-ceiling external windows, glass doors etc.), special installation requirements must be agreed.

Joint pattern:
Shifts in the joint pattern must be kept to a minimum. The alignment deviations must not exceed the maximum tolerances of DIN 18202, Table 4.

Adhesive bond:
If the adhesive bond between the system tile and the joint is to be determined, a confirmation sample must be taken from the existing floor. Retention samples are not required. The following adhesive bond values between tile and joint must be achieved: nominal strength 1.0 N/mm² / smallest individual value 0.50 N/mm² (based on DIN EN 12004 and DIN EN ISO 13007, Part 1).

Utilisation of the system floor:
After the floor has been commissioned and used by industrial trucks, it is subjected to a stress test (pressure due to load transfer as a spot load).
The contact area of the tyre must be assessed differently depending on the type of tyres. With regard to the stress on the floor, it is not the frequency of use but the axle load in conjunction with the type of tyres that is decisive.
Based on the load groups according to DIN 18560, Part 7, only tyres made of polyurethane elastomer (Vulkollan®), rubber, elastic and pneumatic tyres may be used on the floor. Polyamide castors and steel tyres must not be used on the Dry⊥ile system floor.

008 Possible applications

The Dry⊥ile flooring system can be used on all horizontal surfaces. Exceptions are represented by stairs and ramps, the entire outdoor area, and wet areas indoors with water exposure classes W1-I with floor drainage, W2-I and W3-I in accordance with DIN 18534. The installation system cannot be used on wall surfaces either.

009 Connections to the Dry⊥ile system floor

Equal-height connections to the Dry⊥ile system floor:
The connection between the Dry⊥ile system floor and existing or newly-created building components is made as described under 006 Processing and installation instructions => Expansion joints. Height differences between the system floor and the existing surfaces can be created with conventional thin-bed bonding or by using prefabricated metal ramp profiles.

Fastenings on/through the system floor:
A force-fit connection between the Dry⊥ile system floor and the substrate or penetrating components (clamping) must be avoided. A sliding function would otherwise be impossible in this area.
Penetrating fixings must therefore be made “contact-free”, e.g. using spacers.

010 List of standards/regulations

Standards
DIN 18352
Floor and wall tiling works

DIN 18202
Tolerances in building construction

DIN 18534
Waterproofing for indoor applications

DIN EN 12004
Adhesives for ceramic tiles

ISO 13007, Part 1
Ceramic tiles – Grouts and adhesives

DIN 18560, Part 7
Floor screeds – Part 7: Heavy-duty screeds (industrial screeds)

DIN 18365
Flooring works

Data sheets
Cement data sheet: Cement technology B8, issue 4/2014
Publisher: Informations-Zentrum Beton GmbH, Steinhof 39, 40699 Erkrath; www.beton.org

ZDB data sheet: Expansion joints
Publisher: Fachverband Fliesen und Naturstein im ZDB e.V., Berlin

ZDB data sheet: Height differences
Publisher: Fachverband Fliesen und Naturstein im ZDB e.V., Berlin

Subject to errors.

Please also watch the corresponding training film for technical data sheet DT01 **“Laying DryTile correctly”** under the following QR code: