TECHNICAL REPORT

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Ceramic tiles — Guidelines for installation —

Part 1: Installation of ceramic wall and floor tiles

Carreaux et dalles céramiques — Lignes directrices pour l'installation —
Partie 1: Installation des carreaux et dalles céramiques au sol et aux murs

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 189, *Ceramic tile*.

ISO/TR 17870 consists of the following parts, under the general title *Ceramic tiles — Guidelines for installation*:

— *Part 1: Installation of ceramic wall and floor tiles*

— *Part 2: Installation of thin ceramic wall and floor tiles and panels*

Introduction

There are currently International Standards available for

— ceramic tiles, and

— adhesives and grouts for tiles.

NOTE ISO 13007-5, dealing with liquid-applied waterproofing membranes for use beneath ceramic tiling bonded with adhesives, is under preparation.

For these products to give satisfactory service, they need to be selected and installed competently, and they have to receive appropriate initial treatment, protection, and maintenance.

Some countries have published standards and/or guides that specify the design and installation of ceramic tiling. The purpose of ISO/TR 17870 is to foster good installation practices for ceramic wall and floor tiles, internationally.

Ceramic tiles — Guidelines for installation —

Part 1:
Installation of ceramic wall and floor tiles

1 Scope

This part of ISO/TR 17870 defines the quality of ceramic tiling and provides guidance for materials selection, installation and use, to achieve required levels of quality and performance.

It considers aspects related to the specification and installation of the tiling project, in terms of:

— manufacture and distribution of the materials (ceramic tiles, adhesives, grouts, etc.);

— specification of the tiling;

— installation of the tiling (tile fixing operations).

It is applicable to internal and external floor and wall ceramic tiling, installed by either cement mortar or other adhesive methods.

NOTE The quality of ceramic tiling depends on the following general characteristics:

— regularity;

— durability;

— safety.

The durability of the tiling can depend on its use and management.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 General

2.1.1
ceramic tiling
ceramic tiles installed, together with its associated bedding and jointing

2.1.2
design (of ceramic tiling)
specification (of ceramic tiling)
selection of ceramic tiles, backgrounds, fixing methods, and fixing and jointing materials as appropriate for the structure and intended use

2.1.3
installation (of ceramic tiling)
tile fixing
application of ceramic tiling in accordance with the specification

2.2 Components of ceramic tiling

2.2.1
background
material system used as a base over which the ceramic tile is to be fixed

2.2.2
filling out layer
separate application of material to achieve the required vertical flatness (walls)

EXAMPLE Plaster, render, proprietary tile backer boards.

2.2.3
fixing surface
plane rigid surface upon which the tile is fixed

2.2.4
insulating layer
layer included to obtain sound or thermal insulation

2.2.5
intermediate joint
movement joint to divide large areas of tiling into smaller, approximately square areas

2.2.6
levelling layer
layer applied to compensate for unevenness and differences in height of the base or to accommodate services (floors)

2.2.7
movement joint
joint in tiles, backgrounds, or substrates, designed to accommodate movement

Note 1 to entry: Types of movement joints: structural joint, perimeter joint, intermediate joint.

2.2.8
perimeter joint
movement joint to isolate the ceramic tiling from adjacent building elements

2.2.9
primer
fluid material, used separately or mixed with binder to form a slurry, applied as a thin layer to improve adhesion of the bedding to the background, or to isolate the bedding material from the background surface

2.2.10
separating layer
material which separates layers within the tiling system

2.2.11
structural joint
movement joint in ceramic tiling to correspond with structural movement joint in the background

2.2.12
tile bed
bedding
layer of specified materials in which the tile is set and which bonds the tiles to the background

2.2.13
tile joint
space between adjacent tiles

2.2.14
waterproofing membrane
continuous layer of impervious material to resist the passage of water

2.3 Tiling techniques and operations

2.3.1
bonded method
floor tiling laid with a system which ensures that the bedding is bonded to the background

2.3.2
buttering method
adhesive or mortar applied to the back of the tiles, just before the tile is placed

2.3.3
contact area
proportion of the tile back and/or background support that is in contact with the bedding after the tile has been fixed into position

2.3.4
direct bedding
tile fixing directly onto a structural background

2.3.5
floating method
adhesive or mortar applied to the fixing surface, just before the tile is placed

2.3.6
floating and buttering method
adhesive or mortar applied to the fixing surface and to the back of the tile, just before the tile is placed

2.3.7
grouting
operation of filling the joint space between tiles other than at movement joints

2.3.8
maintenance (of ceramic tiling)
all aspects of the cleaning, treatment, and periodic repair of damage to the ceramic tiling

2.3.9
plastering
application of a gypsum plaster to a vertical background

2.3.10
rendering
application of a cement mortar to a vertical background

2.3.11
screeding
application of a screed on a floor background

2.3.12
tanking
application of an impermeable layer beneath tile and bedding to prevent water penetration into the background

2.3.13
unbonded method
any method of laying floors which provides separation of the tiling system from the background

2.4 Characteristics/aspects of ceramic tiling

2.4.1
durability
quality of tiling which maintains its characteristics over time

2.4.2
flatness
conformity of the surface of the tiling to a theoretical plane within an allowable tolerance

2.4.3
levelness
conformity of the surface of floor tiling to a fixed horizontal level within an allowable tolerance

2.4.4
lipping
deviation between tile surfaces either side of a joint (including movement joints)

2.4.5
plumbness
conformity of the surface of wall tiling, designed to be vertical, to a fixed plane within an allowable tolerance

2.4.6
slip resistance
ability of a floor tile to provide sufficient friction to resist slipping by pedestrians

3 Exchange of information

In order for the correct floor/wall covering to be installed in appropriate conditions, at the right time, etc., it is essential that all parties have a clear understanding of the requirements of the project. To ensure that this is achieved, it is essential that there is wide consultation between all the parties involved in the project, including client, sub-contractors, and materials suppliers.

As each project will be unique, it is impossible to give a definitive list of the information to be exchanged, but the following are common examples.

a) Specification: the information required (see Clause 5).

b) Special attendances: access, unloading, hoisting and storage facilities, heat, light and power, and any additional items considered necessary to expedite the work.

c) Materials: technical specification and instructions for transport, storage, use.

d) Backgrounds: type and age of construction; location within the building; type, characteristics (mechanical strength, deformation, etc.), and regularity of background (see Clause 5); and any need for an intermediate substrate or for movement joints.

e) Associated work: services embedded in or passing through the backgrounds and junctions with other adjacent finishes

f) Finishes: type, size, and colour of tiles and layout requirements.

g) Installation: type and technique (see Clause 6).

h) Programme: a time schedule for the progress of the work taking into consideration drying and curing periods of backgrounds and tiling until completion.

4 Materials

4.1 General

This clause identifies and lists the materials that can be involved in a ceramic tiling installation, and defines the main information and rules that apply to these materials.

The identification and selection of materials suitable for any given application are aspects of the specification. The relative criteria are therefore set out in 5.3.

4.2 Basic materials

The basic materials for tiling are the following:

— finishing layer:
  — ceramic tiles;
  — cementitious grouts;
  — reaction resin grouts;
  — pre-prepared or proprietary grouts;
— bedding:
  — mortar;
  — cement;
  — other binders;
  — sand and aggregates (gravel, crushed stone, etc.);
  — water;
  — admixtures;
  — adhesives;
— movement joints:
  — sealants;
  — primers;
  — back-up materials;
  — special components (profiles, etc.).

Additional intermediate layers can be the following:

— primers;
— separating layer;
— filling out layer;
— levelling layer;
— anti-fracture/de-coupling membranes;
— waterproofing membrane;