

English Version

## Adhesives for tiles - Concrete slabs for tests

Colles à carrelage - Plaques de béton pour essais

Mörtel und Klebstoffe für Fliesen und Platten - Betonplatten  
für Prüfungen

This European Standard was approved by CEN on 21 January 2007.

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## Foreword

This document (EN 1323:2007) has been prepared by Technical Committee CEN/TC 67 “Ceramic tiles”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2008, and conflicting national standards shall be withdrawn at the latest by February 2008.

This document supersedes EN 1323:1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## 1 Scope

This European Standard specifies the substrate (concrete slab) to be used for the determination of the properties of adhesives for tiles.

This European Standard does not contain performance requirements or recommendations for the design and installation of ceramic tiles.

NOTE Ceramic tile adhesives can also be used for other types of tiles (natural and agglomerated stones etc), if they do not adversely affect the stones.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 197-1, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

## 3 Test conditions

The standard conditions shall be  $(23 \pm 2) ^\circ\text{C}$  and  $(50 \pm 5) \%$  relative humidity and the air speed in the working area less than 0,2 m/s.

## 4 Apparatus

### 4.1 Pull-head plates

Square metallic (e.g. steel, aluminium) plates, with dimensions of  $(50 \pm 1) \text{ mm} \times (50 \pm 1) \text{ mm}$  and a minimum thickness of 10 mm with a suitable fitting for connection to the tensile testing machine.

### 4.2 Tensile testing machine

A tensile testing machine for direct pull tensile force test and with suitable capacity and sensitivity for the test. The machine shall be capable of applying the load to the pull-head plate at the rate of  $(250 \pm 50) \text{ N/s}$ , through a suitable fitting that does not exert any bending force.

### 4.3 Carsten-Röhrchen flask

Carsten-Röhrchen flask or other suitable apparatus for measuring the water absorption at the surface of the concrete slab (see Figure 1).

## 5 Concrete slab

### 5.1 Specification

The concrete slab shall be at least 35 mm thick, have a moisture content of less than 3 % by mass (carbide method) and have a water absorption at the surface after 4 h in the range of  $0,5 \text{ cm}^3$  to  $1,5 \text{ cm}^3$  measured by the method described in 5.4.

The tensile adhesion strength shall be at least 1,5 N/mm<sup>2</sup>. The tensile adhesion strength shall be determined by bonding at least five pull head plates (see 4.1) directly to the slab, e.g. with an epoxide resin, and determining the tensile adhesion strength by applying a force which increases at a constant rate of (250 ± 50) N/s.

The test surface shall have a finish similar to that obtained by using a wooden float and be clean and dust-free at the time of the test.

## 5.2 Manufacture of the concrete slab

The specification (see 5.1) can be achieved by using the following procedure to manufacture the concrete slab:

- binder: Portland cement type CEM I 42,5 R in accordance with EN 197-1;
- aggregate: gravel sand, of 0 mm to 8 mm particle size, continuous grading curve between A and B (see Figure 2);
- mix ratio binder and aggregate: 1:5 in proportion by mass;
- ultrafines content per m<sup>3</sup> of ready mixed concrete: 500 kg/m<sup>3</sup> prepared concrete. The concrete shall contain ultra fines in order to be properly workable and have a closed structure; the ultra fines content consists of cement and aggregate particle size up to 0,125 mm;
- water/cement ratio: 0,5 by mass;
- manufacture: vertically or horizontally in moulds, avoid the use of any mould release agent;
- compaction: 90 s on a vibrating table at 50 Hz.

## 5.3 Conditioning of the concrete slab

The slabs shall be stored for 24 h under standard conditions, followed by six days water immersion at (20 ± 2) °C.

Before being tested the concrete slabs shall be stored separately, in vertical position, in a dry and ventilated environment, for at least three months and conditioned for 24 h under standard conditions.

## 5.4 Water absorption at the surface

Water absorption at the surface of the concrete slab shall be determined by the following method.

- a) Bond a graduated glass measuring tube (Carsten-Röhrchen flask) to the concrete slab, by means of a suitable sealant.
- b) After the sealant has cured, fill the measuring tube with water, to the upper level.
- c) Record the water level every 60 min during the 4 h of the test, and draw the absorption as a function of time.
- d) Perform at least 3 tests on a reference concrete slab from each batch.

## **6 Test report**

The following items shall be recorded in the test report:

- a) number and year of issue of this European Standard, i.e. EN 1323:2007;
- b) description of the concrete slab and reference to the batch;
- c) handling and storage of concrete slabs before testing;
- d) water absorption of concrete slab, representative of the batch;
- e) moisture content of concrete slabs, representative of the batch;
- f) tensile adhesion strength of concrete slab, representative of the batch;
- g) any other factor that could have influenced the result;
- h) date of the test.

The conformance of the concrete slabs to this European Standard shall be confirmed in the test report.

Dimensions in millimetres

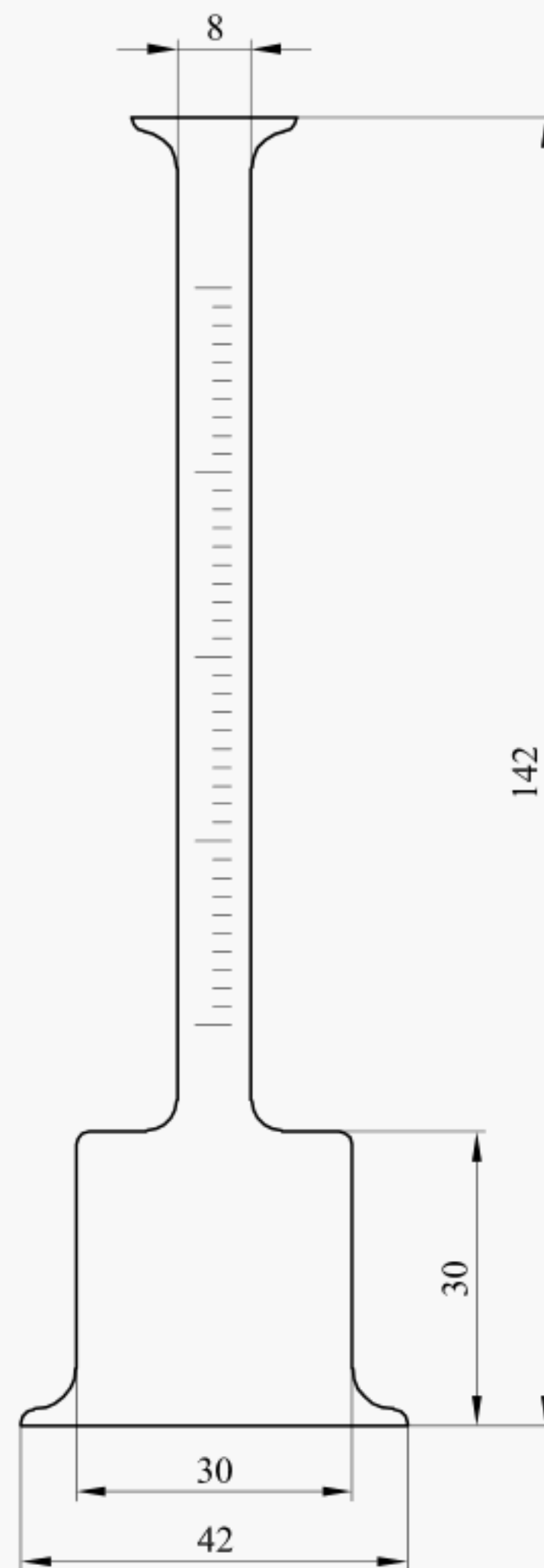
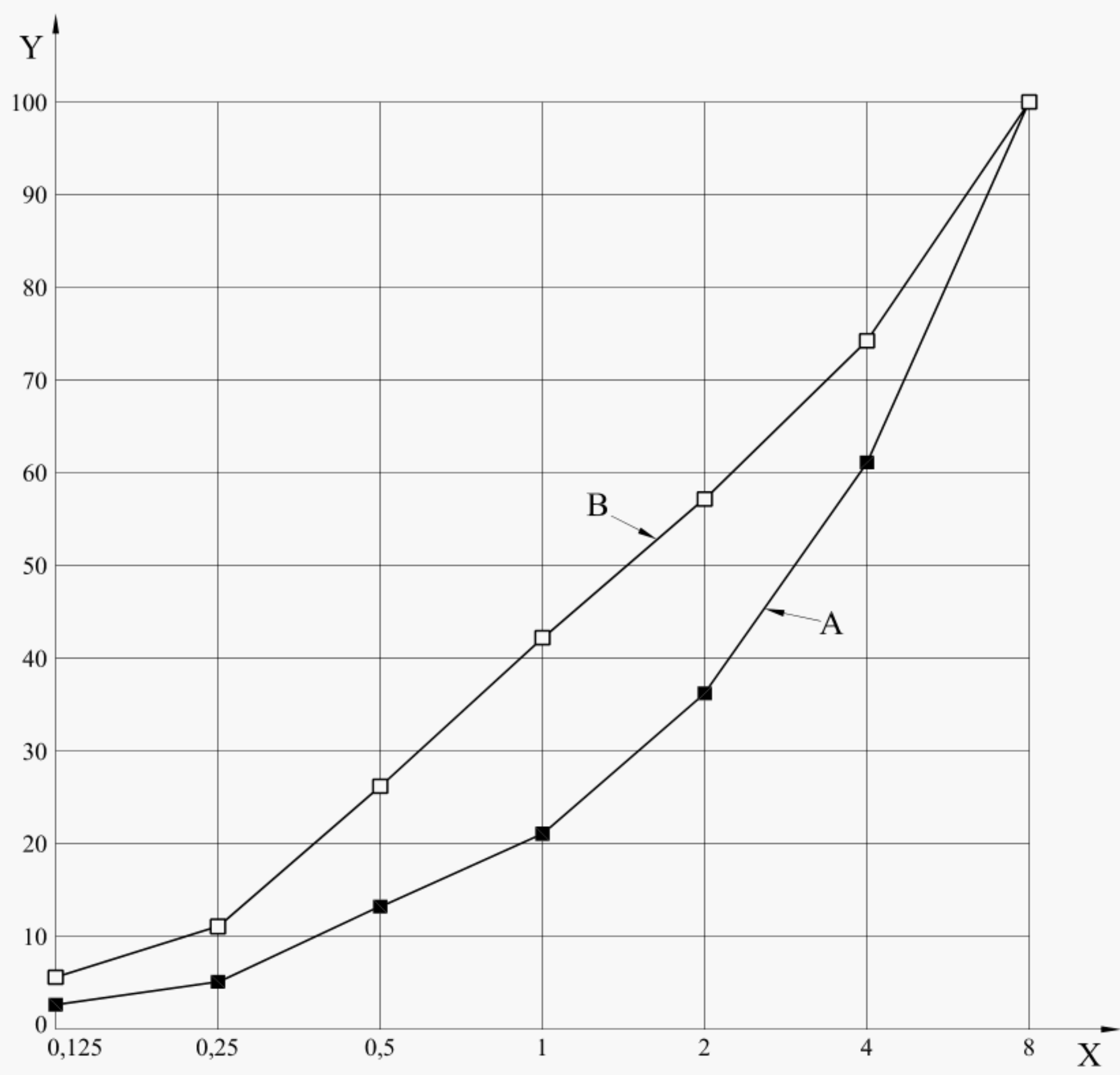


Figure 1 — Apparatus for evaluating water absorption



**Key**

Y    undersize as a percentage by mass

X    nominal opening size in mm

Figure 2 — Grading curves for 8 mm maximum particle size



