



**SLOVENSKI STANDARD**  
**SIST EN 1015-10:2001**  
**01-februar-2001**

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a UgYglf^bY'a UHr

Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar

Prüfverfahren für Mörtel für Mauerwerk - Teil 10: Bestimmung der Trockenrohddichte von Festmörtel

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Méthodes d'essai des mortiers pour la maçonnerie - Partie 10: Détermination de la masse volumique apparente sèche du mortier durci

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**Ta slovenski standard je istoveten z: EN 1015-10:1999**

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**ICS:**

91.100.10 Cement. Mavec. Apno. Malta Cement. Gypsum. Lime.  
Mortar

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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 1015-10

August 1999

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English version

## Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar

Méthodes d'essai des mortiers pour maçonnerie - Partie 10: Détermination de la masse volumique apparente sèche du mortier durci

Prüfverfahren für Mörtel für Mauerwerk - Teil 10: Bestimmung der Trockenrohichte von Festmörtel

This European Standard was approved by CEN on 8 July 1999.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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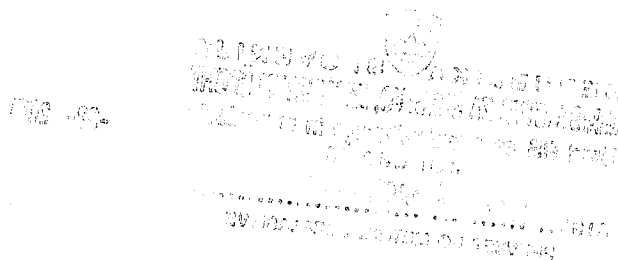
EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 125 "Masonry", the secretariat of which is held by BSI.

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 2000, and conflicting national standards shall be withdrawn at the latest by December 2001.

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

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## 1 Scope

This European Standard specifies a method for determining the dry bulk density of hardened mortars. It is applicable to lightweight and general purpose and thin layer mortars using specimens of regular shape.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

|            |  |
|------------|--|
| prEN 998-1 | Specification for mortar for masonry - Part 1 : Rendering and plastering mortar with inorganic binding agents            |
| prEN 998-2 | Specification for mortar for masonry - Part 2 : Masonry mortar   |
| EN 1015-2  | Methods of test for mortar for masonry - Part 2 : Bulk sampling of mortars and preparation of test mortars               |
| EN 1015-3  | Methods of test for mortar for masonry - Part 3 : Determination of consistence of fresh mortar (by flow table)           |
| EN 1015-11 | Methods of test for mortar for masonry - Part 11 : Determination of flexural and compressive strength of hardened mortar |

## 3 Principle

The dry bulk density of a given specimen of hardened mortar is determined as the quotient of its mass in oven dried condition, and the volume which it occupies when submerged in water in a saturated condition.

## 4 Symbols

|             |  |
|-------------|--|
| $m_{s,dry}$ | is the oven dry mass of specimen of hardened mortar, in kilograms (kg)                             |
| $m_{s,sat}$ | is the mass of saturated specimen of hardened mortar, in kilograms (kg)                            |
| $m_{s,i}$   | is the apparent mass of saturated specimen of hardened mortar immersed in water, in kilograms (kg) |
| $\rho_w$    | is the density of water in kilograms per cubic metre ( $\text{kg/m}^3$ )                           |
| $V_s$       | is the volume of specimen of hardened mortar, in cubic metres ( $\text{m}^3$ )                     |

## 5 Apparatus

**5.1. A weighing instrument** accurate to 0,1 % of the total mass of the specimen and equipped with a specimen-bearing stirrup for weighing the specimen submerged in water;

**5.2. A ventilated oven**, capable of maintaining a temperature of  $70\text{ °C} \pm 5\text{ °C}$  or  $60\text{ °C} \pm 5\text{ °C}$ ;

**5.3. Moulds** as described in EN 1015-11.

## 6 Sampling, preparation and storage of test samples

The fresh mortar for this test shall have a volume of not less than 50 times the maximum aggregate particle size, and in no case less than 50 ml or 1,5 times the quantity needed to perform the test, whichever is the greater. It shall be obtained either by reduction of the bulk test sample (see EN 1015-2) using a sample divider or by quartering or by preparation from dry constituents and water in the laboratory. The flow value of the mortar in the bulk test sample shall be determined in accordance with EN 1015-3 and reported.

Laboratory mixed samples shall, before testing, be brought to a defined flow value as specified in EN 1015-2

Ready to use mortars (factory-made wet mortars which are retarded), and pre-batched air-lime/sand wet mortars when not gauged with hydraulic binders, shall be tested within their specified workable life.

The length of mixing period shall be measured from the moment all constituents are introduced into the mixer.

Before testing, the batch shall be gently stirred by hand using a trowel or palette knife in 5 s to 10 s to counteract any false setting etc., but without any additional mixing of the batch.

Any deviation from the mixing procedure shall be noted.

A test sample shall comprise three specimens prepared in moulds, their shape, preparation and storage being in accordance with EN 1015-11.

## 7 Procedure

### 7.1 Drying to constant mass

Dry the specimen in the oven at a temperature of  $70\text{ °C} \pm 5\text{ °C}$  until the constant mass is reached. For samples with organic constituents, e.g. expanded polystyrene aggregate, use a drying temperature of  $60\text{ °C} \pm 5\text{ °C}$ . The specimen is considered to have reached constant mass if two consecutive weighings 2 h apart during the drying, do not differ by more than 0,2 % of the mass of the dry specimen. Record the mass of the specimen,  $m_{s,dry}$  in kg to the nearest 0,1 %.

## 7.2 Determination of the volume of the specimen by means of displacement

Immerse the specimen in water at  $20\text{ °C} \pm 2\text{ °C}$  until no further increase in apparent mass is observed. This is considered reached when two consecutive weighings, 15 min apart during the immersion, do not differ by more than 0,2 % by mass. Weigh the wet specimen after the removal of any surplus water, using a moist cloth, and record its mass,  $m_{s,sat}$  in kg to the nearest 0,1 %.

The volume of the specimen may now be determined by weighing in water.

Allow the weighing instrument to reach equilibrium, ensuring that the empty stirrup, hanging from it, is completely immersed in the water tank. Immerse the stirrup to the same depth when making weighings with or without the specimen. Place the wet specimen on the stirrup. Avoid trapping air bubbles on the sides of the specimen and record the mass of the specimen,  $m_{s,i}$  in kg in this immersed position.

The volume of the specimen in  $\text{m}^3$  is given by the formula :

$$V_s = \frac{m_{s,sat} - m_{s,i}}{\rho_w}$$

## 8 Calculation and expression of results

Calculate the dry bulk density of each mortar specimen as the ratio of the recorded mass,  $m_{s,dry}$ , to the volume  $V_s$ .

Calculate the mean value from the individual values of each mortar specimen, all values rounded to the nearest  $10\text{ kg/m}^3$ .

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