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Bevarande av kulturarv – Testmetoder – Analys av vattenabsorption med hjälp av mätrör

Conservation of cultural heritage – Test methods – Measurement of water absorption by pipe method



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EUROPEAN STANDARD

EN 16302

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2013

ICS 97.195

English Version

Conservation of cultural heritage - Test methods - Measurement of water absorption by pipe method

Conservation des biens culturels - Méthodes d'essai -
Mesurage de l'absorption d'eau par la méthode à la pipette

Erhaltung des kulturellen Erbes - Prüfverfahren - Messung
der Wasseraufnahme bei niedrigem Druck

This European Standard was approved by CEN on 28 December 2012.

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Foreword

This document (EN 16302:2013) has been prepared by Technical Committee CEN/TC 346 "Conservation of cultural heritage", 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of an identical text or by endorsement, at the latest by August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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Introduction

This test method can be applied if it does not change the value of the cultural property following the ethical code of conservation practice.

This test aims to measure water penetration under pressure analogous to incident rainfall.

1 Scope

This European Standard specifies a method to measure water absorption of porous inorganic materials used for and constituting cultural property by pipe method.

The method may be used on porous inorganic materials which are untreated or have been subjected to any treatment or ageing.

The method may be used both in the laboratory and in situ due to its non destructive nature.

2 Normative references

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

EN 15898:2011, *Conservation of cultural property — Main general terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15898:2011 and the following apply.

3.1

porous inorganic material

material including natural stones e.g. sandstone, limestone, marble; as well as artificial materials, such as mortar, plaster, brick, and others

Note 1 to entry: See EN 15801.

3.2

water absorption by pipe method

amount of water (ml) transferred from the pipe through a defined test area (cm^2) after a fixed time, expressed as ml/cm^2

3.3

specimen

part considered representative of the material constituting an object

Note 1 to entry: The specimen can have different origins and can be taken from:

- materials similar to those constituting the object under study (e.g. stone quarries);
- specifically prepared comparative materials e.g. reference materials;
- available materials from the object.

Note 2 to entry: The number and dimension of the specimens can be different depending on constraints encountered in sampling the required amount of material.

4 Principle

Determination of the amount and rate at which water is absorbed through the test surface that is in contact with water.

5 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply:

h is the height of the water column measured from the centre of the testing area, in mm

d is the internal diameter of the water column, in mm

D is the diameter of the testing area, in cm

t_i is the time to an intermediate i-measurement, in min

t_f is the time to the final measurement, in min

Q_i is the amount of water absorbed at the time t_i , in ml

Q_5 is the amount of water absorbed after 5 minutes, in ml

Q_f is the amount of water absorbed at the final time t_f , in ml

A is the test area, in cm^2

W_i is the amount of absorbed water (ml/cm^2) per unit of surface area, at the time t_i

W_t is the total amount of absorbed water (ml/cm^2) at the time to the final measurement t_f

T is the average ambient temperature, in $^{\circ}\text{C}$

RH is the relative humidity, in %

6 Test equipment

6.1 General

Typical pipes are made of glass or other transparent material.

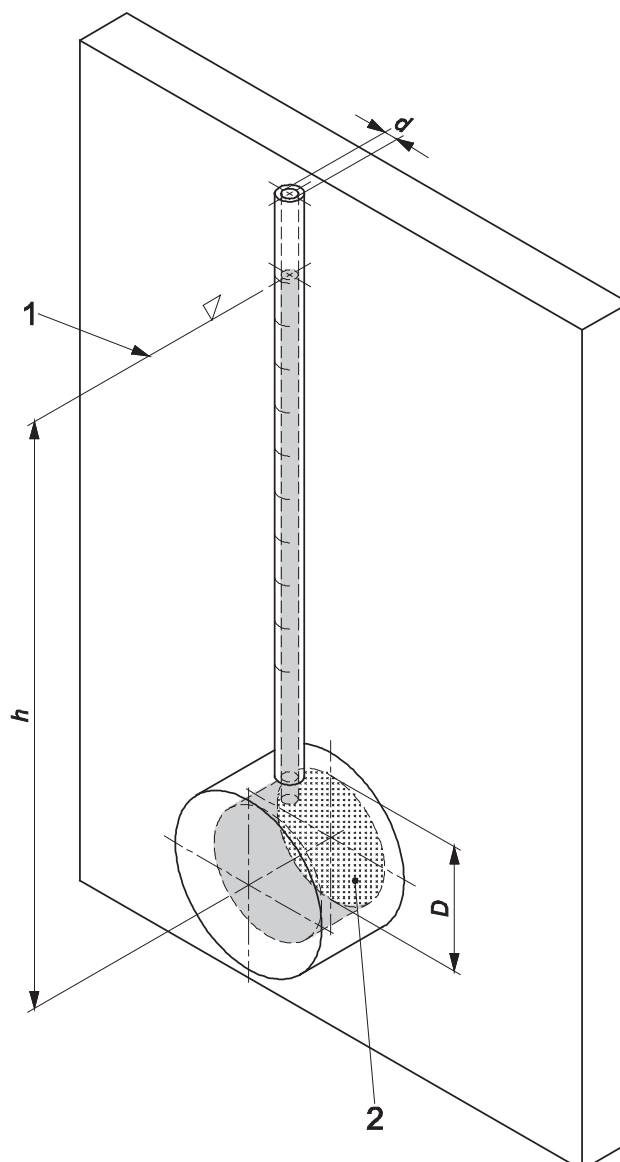
The most common types of pipes are described in Annex A.

Only values obtained with the same type of pipe (identical h , d , D values) can directly be compared.

6.2 Pipe for vertical surfaces (type V)

This type is suitable for measuring the absorption of water through vertical surfaces.

The pipe consists of a graduated tube welded at its lower part on a cylinder cell; it shall be designed so that the graduated tube shows divisions each not greater than 1/50th of the volume of the tube (Figure 1).



Key

- 1 water level
- 2 test surface
- d internal diameter of the water column, in mm
- D diameter of the testing area, in cm
- h height of the water column measured from the centre of the testing area, in mm

Figure 1 — Scheme of pipe type for vertical surface

6.3 Pipe for horizontal surfaces (type H)

This type is suitable for measurement of absorption of water through horizontal surfaces.

The pipe consists of a graduated tube welded to its lower part on a cylinder cell; it shall be designed so that the graduated tube shows divisions each not greater than 1/50th of the volume of the tube (Figure 2).