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Testing methods for pervious concrete —

Part 2: Density and void content

Méthodes d'essai pour ciments perméables —

Partie 2: Titre manque

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Foreword

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This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 1, *Test methods for concrete*.

A list of all parts in the ISO 17785 series can be found on the ISO website.

Testing methods for pervious concrete —

Part 2:
Density and void content

1 Scope

This document specifies a procedure for testing the density and void content of freshly mixed and hardened pervious concrete specimens for pavement in the laboratory or cored from field placements.

This document also specifies formulae for calculating the density and void content of pervious concrete.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
density
ratio of the mass of a given quantity of concrete to its volume, (kg/m^3)

3.2
void content
percentage (%) of voids

3.3
pervious concrete
concrete which has interconnected voids that allow for water flow through them.

Note 1 to entry: Pervious concrete for pavement is usually made with little or no fine aggregate and contains narrowly graded coarse aggregate typically with the maximum size of 10 mm. The nominal maximum size is 25 mm.

4 Principle

4.1 Freshly mixed pervious concrete

For fresh pervious concrete, a sample is placed and consolidated in a standard measure. The density and void content of the pervious concrete are calculated based on the measured mass of the consolidated concrete specimen, the volume of the measure, and the total mass of materials batched.

The measured fresh density may be used as verification of mixture proportion.

4.2 Hardened pervious concrete

This test method for hardened pervious concrete applies to either core specimens or moulded cylinders.

For hardened pervious concrete, the dimensions of a specimen are measured to determine its volume. The specimen is dried to reach a constant mass and subsequently immersed in water to determine the volume of solids in the specimen. Void content is calculated using the difference between the total volume and the displaced volume when submerged.

Density and void content determined by other test methods for hardened pervious concrete can produce different numerical results, which can be incomparable.

5 Apparatus

5.1 General

The apparatus shall consist of:

a) making the specimen in the laboratory as instructed in this document, or receipt of a core specimen from the field;

b) equipment for preparing and measuring the test specimens.

5.2 Apparatus for making the specimens

5.2.1 Scoop of a size large enough so each amount of pervious concrete obtained from the sampling receptacle is representative.

5.2.2 Measure, a cylindrical container shall be made of steel or other suitable material not readily attacked by cement paste, having a smooth internal face, with the rim machined to a plane surface. The rim and base shall be parallel. The dimensions of the internal diameter and height of the container shall be not less than 150 mm.

5.2.3 Strike-off plate, a flat rectangular metal plate at least 6 mm thick or a glass or acryl plate at least 12 mm thick with length and width that are at least 50 mm greater than the diameter of the measure with which it is to be used. The edges of the plate shall be straight within a tolerance of 2 mm.

5.2.4 Coring machine to obtain cylindrical cores with a minimum diameter of 100 mm and a minimum height of 100 mm.

5.2.5 Mould, cylindrical container made of steel or other suitable material. The mould shall be made of non-absorbent material which does not react with cement paste. In addition, the mould shall not leak water during the preparing process and the specimens shall be easily demoulded.

5.3 Apparatus for measuring the specimens

5.3.1 Balance or scale accurate to 0,5 g or to within 0,3 % of the test load, whichever is greater, at any point within the range of use. The balance for hardened concrete shall be equipped with suitable apparatus for determining the submerged mass of the test specimen.

5.3.2 Jaw caliper with minimum depth of jaw 65 mm, and measuring range 0 mm to 300 mm with an accuracy to 0,25 mm.

5.3.3 Oven of sufficient size capable of maintaining a uniform temperature of 50 °C ± 5 °C.