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Aggregates for concrete — Test methods for mechanical and physical properties —

Part 5: Determination of particle size distribution by sieving method

Granulats pour béton — Méthodes d'essai relatives aux propriétés mécaniques et physiques —

Partie 5: Détermination de la granularité par tamisage

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Foreword

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Aggregates for concrete — Test methods for mechanical and physical properties —

Part 5: Determination of particle size distribution by sieving method

1 Scope

This document describes the reference washing and dry sieving method used for testing and in case of dispute, for determination of the particle size distribution of aggregates. Other methods can be used provided that an appropriate working relationship with the reference method has been established. It applies to all aggregates, including lightweight aggregates, up to 90 mm nominal size, but excluding filler.

NOTE Dry sieving without washing can be used for aggregates free from particles which cause agglomeration.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

3 Terms and definitions

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

ISO and IEC maintain terminology 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
aggregate
granular material used in construction which can be natural or manufactured

3.2
test portion
sample used as a whole in a single test

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3.3
constant mass
mass determined by successive weighing's performed at least 1 h apart and not differing by more than 0,1 %

Note 1 to entry: In many cases, constant mass can be achieved after a test portion has been dried for a pre-determined period in a specified oven (see Clause 6) at 100 °C to 115 °C. Test laboratories may determine the time required to achieve constant mass for specific types and sizes of sample dependent upon the drying capacity of the oven used.

4 Principle

The test consists of dividing and separating a material into several particle size classifications of decreasing sizes by means of a series of sieves. The aperture sizes and the number of sieves are selected in accordance with the nature of the sample and the accuracy required.

The method adopted is washing and dry sieving. When washing can alter the physical properties of a lightweight aggregate, dry sieving shall be used and the procedure specified in 7.1 shall not be applied.

The mass of the particles retained on the various sieves is related to the initial mass of the material. The cumulative percentages passing each sieve are reported in numerical form and, when required, in graphical form.

5 Apparatus

5.1 Test sieves, with apertures conforming to the requirements of ISO 3310-1 and ISO 3310-2. For aperture size of 4,00 mm and above, perforated plate sieves may be used. For nominal sizes of openings of sieves, ISO 565 shall apply.

5.2 Tightly fitting pan and lid, for the sieves.

5.3 Ventilated oven, thermostatically controlled to maintain a temperature of 100 °C to 115 °C, or other suitable equipment for drying the aggregates, if it does not cause any particle size breakdown.

5.4 Washing equipment

5.5 Balances or scales, accurate to ±0,1 % of the test portion mass.

5.6 Trays, brushes

5.7 Sieving machine, (optional).

6 Preparation of test portions

Samples shall be reduced by the use of a sample divider or by quartering to produce the required number of test portions with masses as specified in Table 1.

NOTE It can be necessary to moisten samples containing substantial amounts of fines before reduction to minimize segregation and loss of dust.

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