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Methods of testing cement - Part 6: Determination of fineness

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English Version

Methods of testing cement - Part 6: Determination of fineness

Méthodes d'essai des ciments - Partie 6: Détermination de la finesse

Prüfverfahren für Zement - Teil 6: Bestimmung der Mahlfeinheit

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 196-6:2010) has been prepared by Technical Committee CEN/TC 51 “Cement and building limes”, the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by July 2010, and conflicting national standards shall be withdrawn at the latest by July 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 196-6:1989.

EN 196, *Methods of testing cement*, consists of the following parts:

— *Part 1: Determination of strength*

— *Part 2: Chemical analysis of cement*

— *Part 3: Determination of setting times and soundness*

— *Part 5: Pozzolanicity test for pozzolanic cement*

— *Part 6: Determination of fineness*

— *Part 7: Methods of taking and preparing samples of cement*

— *Part 8: Heat of hydration — Solution method*

— *Part 9: Heat of hydration — Semi-adiabatic method*

— *Part 10: Determination of the water-soluble chromium (VI) content of cement*

NOTE A previous part, EN 196-21, *Methods of testing cement — Determination of the chloride, carbon dioxide and alkali content of cement*, has been revised and incorporated into EN 196-2.

Another document, ENV 196-4, *Methods of testing cement — Quantitative determination of constituents*, has been published as CEN/TR 196-4, *Methods of testing cement — Part 4: Quantitative determination of constituents*.

This edition introduces the following technical changes based on comments received by the Secretariat:

a) A method to determine the residue on sieving by air-jet equipment is included;

b) The method for calibration of the air permeability equipment has been clarified and an alternative method, avoiding the use of mercury, added;

c) The factors used in the air permeability (Blaine) method have been corrected for errors introduced in the conversion to SI units.

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, Croatia, 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 the United Kingdom.

1 Scope

This European Standard describes three methods of determining the fineness of cement.

The sieving method serves only to demonstrate the presence of coarse cement particles. This method is primarily suited to checking and controlling the production process.

The air-jet sieving method measures the retention on sieving and is suitable for particles which substantially pass a 2,0 mm test sieve. It may be used to determine the particle size distribution of agglomerates of very fine particles. This method may be used with test sieves in a range of aperture sizes, e.g. 63 µm and 90 µm.

The air permeability method (Blaine) measures the specific surface (mass related surface) by comparison with a reference cement sample. The determination of the specific surface serves primarily to check the consistency of the grinding process of one and the same plant. This method only enables a limited assessment to be made of the properties of the cement in use.

NOTE The air permeability method may not give significant results for cements containing ultrafine materials.

The methods are applicable to all the cements defined in EN 197.

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*

ISO 383:1976, *Laboratory glassware — Interchangeable conical ground joints*

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 4803, *Laboratory glassware — Borosilicate glass tubing*

3 Sieving method

3.1 Principle

The fineness of cement is measured by sieving it on standard sieves. The proportion of cement of which the grain sizes are larger than the specified mesh size is thus determined.

A reference sample having a known proportion of material coarser than the specified mesh size is used for checking the specified sieve.

3.2 Apparatus

3.2.1 Test sieve, comprising a firm, durable, non-corrodible, cylindrical frame of 150 mm to 200 mm nominal diameter and 40 mm to 100 mm depth, fitted with, e.g. 90 µm, mesh sieve cloth of woven stainless steel, or other abrasion-resisting and non-corrodible metal wire.