

Tests for thermal and weathering properties of aggregates

Part 4: Determination of drying shrinkage

ICS 91.100.15

National foreword

This British Standard is the UK implementation of EN 1367-4:2008. It supersedes BS EN 1367-4:1998 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/502/6, Test methods.

A list of organizations represented on this committee can be obtained on request to its secretary.

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**Tests for thermal and weathering properties of aggregates - Part
4: Determination of drying shrinkage**

Essais pour déterminer les propriétés thermiques et
l'altérabilité des granulats - Partie 4: Détermination du
retrait au séchage

Prüfverfahren für thermische Eigenschaften und
Verwitterungsbeständigkeit von Gesteinskörnungen - Teil 4:
Bestimmung der Trockenschwindung

This European Standard was approved by CEN on 4 February 2008.

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Foreword

This document (EN 1367-4:2008) has been prepared by Technical Committee CEN/TC 154 "Aggregates", 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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 1367-4:1998.

Testing in accordance with this standard is intended to provide information to assist in judging the performance of aggregates subject to weathering action. This standard is intended to identify aggregates with high moisture sensitivity which in concrete may cause excessive cracking, deflection and loss of durability. This test may not be suitable for lightweight aggregates.

This European Standard is one of a series of tests for thermal and weathering properties of aggregates as listed below.

EN 1367-1, Tests for thermal and weathering properties of aggregates - Part 1: Determination of resistance to freezing and thawing

EN 1367-2, Tests for thermal and weathering properties of aggregates - Part 2: Magnesium sulfate test

EN 1367-3, Tests for thermal and weathering properties of aggregates - Part 3: Boiling test for "Sonnenbrand basalt"

EN 1367-5, Tests for thermal and weathering properties of aggregates - Part 5: Determination of resistance to thermal shock

Test methods for other properties of aggregates will be covered by Parts of the following European Standards:

EN 932, Tests for general properties of aggregates

EN 933, Tests for geometrical properties of aggregates

EN 1097, Tests for mechanical and physical properties of aggregates

EN 1744, Tests for chemical properties of aggregates

EN 13179, Tests for filler aggregate used in bituminous mixtures

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, 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 standard describes the reference method used for type testing and in cases of dispute, for determining the effect of aggregates on the drying shrinkage of concrete. For other purposes, in particular factory production control, other methods may be used provided an appropriate working relationship with the reference method has been established.

This standard is based on the testing of concretes of fixed mix proportions and aggregates of 20 mm maximum size.

NOTE 1 Guidance on the use of larger size is given in Annex A. Precision data is not available for variations in size and for variations in the water content of the test concrete.

NOTE 2 In those cases where the drying shrinkage of a source of coarse aggregate only or a source of fine aggregate (sand) only are required, the other component to be used should be, respectively, a fine or coarse aggregate of known low shrinkage.

NOTE 3 Aggregates with high water demand and/or porosity may in a concrete with a fixed water content result in a mix with insufficient workability to allow full compaction of the test specimens. This is likely to occur with aggregates combinations having a composite water absorption value greater than 3,5% or oven-dried particle densities less than 2,45 Mg/m³ (e.g. for recycled aggregates). In such instances a variation of the method (without precision data) may be carried out by one of the following changes to the concrete mix:

(a) use of aggregates in the saturated and surface dry condition.

(b) use of water-reducing admixture.

A note on the details of any modification to the mix design should be included with the test report.

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*

EN 932-1, *Tests for general properties of aggregates - Part 1: Methods for sampling*

EN 932-2, *Tests for general properties of aggregates - Part 2: Methods for reducing laboratory samples*

EN 932-5, *Tests for general properties of aggregates - Part 5: Common equipment and calibration*

EN 933-2, *Tests for geometrical properties of aggregates - Part 2: Determination of particle size distribution - Test sieves, nominal size of apertures*

3 Terms and definitions

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

3.1

laboratory sample

sample intended for laboratory testing

NOTE The laboratory sample is generally the penultimate stage in a multi-stage sampling procedure.