

# SLOVENSKI STANDARD SIST EN 1097-4:2008

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Tests for mechanical and physical properties of aggregates - Part 4: Determination of the voids of dry compacted filler **STANDARD PREVIEW** 

## Prüfverfahren für mechanische Und physikalische Eigenschaften von Gesteinskörnungen - Teil 4: Bestimmung des Hohlraumgehaltes an trocken verdichtetem Füller

SIST EN 1097-4:2008

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Essais pour déterminer les caractéristiques mécaniques et physiques des granulats -Partie 4: Détermination de la porosité du filler sec compacté

Ta slovenski standard je istoveten z: EN 1097-4:2008

ICS:

91.100.15

Mineralni materiali in izdelki Mineral materials and products

SIST EN 1097-4:2008

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#### SIST EN 1097-4:2008

# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

## EN 1097-4

March 2008

ICS 91.100.15

Supersedes EN 1097-4:1999

**English Version** 

### Tests for mechanical and physical properties of aggregates -Part 4: Determination of the voids of dry compacted filler

Essais pour déterminer les caractéristiques mécaniques et physiques des granulats - Partie 4: Détermination de la porosité du filler sec compacté Prüfverfahren für mechanische und physikalische Eigenschaften von Gesteinskörnungen - Teil 4: Bestimmung des Hohlraumgehaltes an trocken verdichtetem Füller

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

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

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#### EN 1097-4:2008 (E)

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### Foreword

This document (EN 1097-4:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.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 1097-4:1999.

This European Standard forms part of a series of standards for tests for mechanical and physical properties of aggregates. 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 1367, Tests for thermal and weathering properties of aggregates VIEW

EN 1744, Tests for chemical properties of aggregates.iteh.ai)

EN 13179, Tests for filler aggregate used in bituminous mixtures

#### SIST EN 1097-4:2008

The other Parts of EN 1097 are: 99d52099af98/sist-en-1097-4-2008

Part 1: Determination of the resistance to wear (micro-Deval)

Part 2: Methods for the determination of resistance to fragmentation

Part 3: Determination of loose bulk density and voids

Part 5: Determination of the water content by drying in a ventilated oven

Part 6: Determination of particle density and water absorption

Part 7: Determination of the particle density of filler - Pyknometer method

Part 8: Determination of the polished stone value

Part 9: Determination of the resistance to wear by abrasion from studded tyres - Nordic test

Part 10: Determination of water suction height

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, the determination of the voids of dry compacted filler by means of a Rigden apparatus. For other purposes, in particular factory production control, other methods may be used provided that an appropriate working relationship with the reference method has been established. The test is applicable to natural and manufactured fillers. It is used, for example to determine their bitumen carrying capacity.

#### 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 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 1097-7, Tests for mechanical and physical properties of aggregates - Part 7: Determination of the particle density of filler - Pyknometer method

EN 10025 (all parts), Hot rolled products of non-alloy structural steels

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#### 3 Terms and definitions

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

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#### percentage air voids

volume of air filled space in the filler, expressed as a percentage of the total volume of the filler after compaction by a standard method

#### 3.2

3.1

#### laboratory sample

reduced sample derived from a bulk sample for laboratory testing

#### 3.3

#### test portion

sample used as a whole in a single test

#### 3.4

#### test specimen

sample used in a single determination when a test method requires more than one determination of a property

#### 3.5

#### constant mass

successive weighings after drying at least 1 h apart not differing by more than 0,1 %

NOTE In many cases constant mass can be achieved after a test portion has been dried for a pre-determined period in a specified oven at  $(110 \pm 5)$  °C. Test laboratories can determine the time required to achieve constant mass for specific types and sizes of sample dependent upon the drying capacity of the oven used.

#### 3.6

#### filler aggregate

aggregate, most of which passes a 0,063 mm sieve, which can be added to construction materials to provide certain properties

#### 4 Principle

The filler is compacted in a standard way by using a compaction apparatus.

The volume of the compacted filler is determined using the height of the compacted filler bed. Using the known particle density of the compacted filler, the air void content of the compacted filler is calculated.

#### **5** Apparatus

**5.1** All apparatus, unless otherwise stated, shall conform to the general requirements of EN 932-5.

**5.2** Ventilated drying oven, thermostatically controlled to maintain a temperature of (110 ± 5) °C.

- **5.3 Desiccator**, filled with an appropriate amount of desiccant.
- 5.4 Spatula

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5.5 Compaction apparatus, made of hardened steel, conforming to EN 10025, consisting of the following elements.

NOTE Examples of typical apparatus are shown in Figure 1 and Figure 2.

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**5.5.1** Dropping block, comprising a hollow cylinder with  $a^2$  flat, closed bottom, with an inner diameter of (25 ± 1) mm and an inner height of (65 ± 5) mm. The cylinder shall be fitted with a collar or pilot blocks to guide it along the pilot bars during the test.

**5.5.2 Plunger**, with a bore hole along its longitudinal axis of diameter  $(1,6 \pm 0,1)$  mm over a length of 10 mm from the bottom and equal or wider above.

The difference in the diameter between the plunger and the cylinder shall be  $(0,20 \pm 0,05)$  mm.

The plunger shall be provided with a circumferential groove about 5 mm from its lower end to accommodate filler that works up the side of the cylinder while in use. This groove shall be 2 mm to 3 mm wide and 1 mm to 2 mm deep.

The mass of the plunger shall be  $(350 \pm 1)$  g and the mass of the dropping block with plunger shall be  $(875 \pm 25)$  g.

NOTE For newly manufactured apparatus, the following dimensions should be used.

a) Dropping block	inner diameter of	(25,4 ± 0,1) mm;
	inner height of	(63 ± 0,1) mm;
b) Mass of dropping block with plunger		(875 ± 10) g.



Key 1 Dropping block 2 Plunger 3 Base plate 4 Tare boring

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Figure 1 - Typical compaction apparatus



Figure 2 - Typical four bar compaction apparatus

**5.5.3** Base plate (solid), rectangular with a minimum length of 150 mm, and minimum width of 100 mm, or circular with a minimum diameter of 140 mm, and a minimum height of 20 mm. Two (see Figure 1) or four (see Figure 2) upright pilot bars shall be mounted on the base plate to allow the dropping block and plunger to fall freely.

The maximum dropping height of  $(102 \pm 1)$  mm shall be indicated by a stop on the pilot bars, preferably in combination with spacers to keep the pilot bars exactly parallel.

During compaction the apparatus shall be securely clamped or screwed onto a sturdy, non-flexible and even base (e.g., a concrete cube or pillar).