



SLOVENSKI STANDARD
SIST EN 933-10:2002
01-september-2002

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Tests for geometrical properties of aggregates - Part 10: Assessment of fines - Grading of fillers (air jet sieving)

Prüfverfahren für geometrische Eigenschaften von Gesteinskörnungen - Teil 10: Beurteilung von Feinanteilen - Kornverteilung von Füller (Luftstrahlsiebung)

Essais pour déterminer les caractéristiques géométriques des granulats - Partie 10: Détermination des fines - Granularité des fillers (tamisage dans un jet d'air)

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91.100.15 Mineralni materiali in izdelki Mineral materials and products

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en

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EUROPEAN STANDARD

EN 933-10

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2001

ICS 91.100.15

English version

Tests for geometrical properties of aggregates - Part 10: Assessment of fines - Grading of fillers (air jet sieving)

Essais pour déterminer les caractéristiques géométriques
des granulats - Partie 10: Détermination des fines -
Granularité des fillers (tamisage dans un jet d'air)

Prüfverfahren für geometrische Eigenschaften von
Gesteinskörnungen - Teil 10: Beurteilung von Feinanteilen -
Kornverteilung von Füller (Luftstrahlsiebung)

This European Standard was approved by CEN on 18 January 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

	Page
Foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions.....	4
4 Principle.....	4
5 Apparatus.....	5
6 Preparation of test portions.....	5
7 Procedure.....	5
8 Calculation and expression of results.....	7
9 Test report.....	7
Annex A (informative) Example of a test data sheet.....	8
Annex B (informative) Precision.....	9
Annex C (informative) Graphical presentation of results.....	10

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC154 "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 2001, and conflicting national standards shall be withdrawn at the latest by December 2003.

This standard forms part of a series of tests for geometrical 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 1097	Tests for mechanical and physical properties of aggregates
EN 1367	Tests for thermal and weathering properties of aggregates
EN 1744	Tests for chemical properties of aggregates
EN 13179	Tests for filler aggregate used in bituminous mixtures

The other parts of EN 933 will be:

- Part 1: Determination of particle size distribution - Sieving method
- Part 2: Determination of particle size distribution - Test sieves, nominal size of apertures
- Part 3: Determination of particle shape - Flakiness index
- Part 4: Determination of particle shape - Shape index
- Part 5: Determination of percentage of crushed and broken surfaces in coarse aggregate particles
- Part 6: Assessment of surface characteristics - Flow coefficient for aggregates
- Part 7: Determination of shell content - Percentage of shells in coarse aggregates
- Part 8: Assessment of fines - Sand equivalent test
- Part 9: Assessment of fines - Methylene blue test

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Annexes A, B and C are informative. [http://catalog/standards/sist/7f16b7ca-4378-4d68-a33b-0ef70d679709/sist-en-933-10-2002](#)

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a method using air jet sieving for the determination of the particle size distribution of fillers by mass. It applies to fillers of natural or artificial origin up to 2 mm nominal size.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

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*

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3 Terms and definitions

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

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3.1

filler

aggregate, most of which passes a 0,063 mm sieve

3.2

laboratory sample

sample intended for laboratory testing

3.3

test portion

sample used as a whole in a single test

3.4

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 ± 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.

4 Principle

The test consists of dividing up and separating, by means of a series of sieves, a filler into several granular classifications of decreasing sizes. The aperture sizes and the number of sieves are specified in 5.2. The test is in particular well suited for materials which when dry neither tend to agglomeration nor to electrostatic charge.

The method adopted is dry air jet sieving.

The mass of the particles passing each sieve is related to the initial mass of the material. The percentages obtained are used either in their numerical form or in a graphical form.

5 Apparatus

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

5.2 Test sieves, with round frame of 200 mm nominal diameter and square aperture sizes of 0,063 mm, 0,125 mm and 2 mm in accordance with EN 933-2.

5.3 Air jet sieving apparatus, (general form shown in Figure 1) with a pressure difference of $(3,0 \pm 0,5)$ kPa across the sieve, during the test procedure.

5.4 Ventilated oven, thermostatically controlled to maintain a temperature of $(110 \pm 5)^\circ\text{C}$ or other suitable equipment for drying the filler, if it does not cause any particle breakdown.

5.5 Balance, accurate to $\pm 0,1\%$ of the test portion mass.

5.6 Soft brush.

5.7 Plastic hammer (optional).

6 Preparation of test portions

Laboratory samples shall be reduced in accordance with EN 932-2 to produce test portions.

The test portion shall have a mass of $(50,0 \pm 1,0)$ g.

Dry the test portion at $(110 \pm 5)^\circ\text{C}$ to constant mass. Allow to cool, weigh and record as M_1 .

7 Procedure

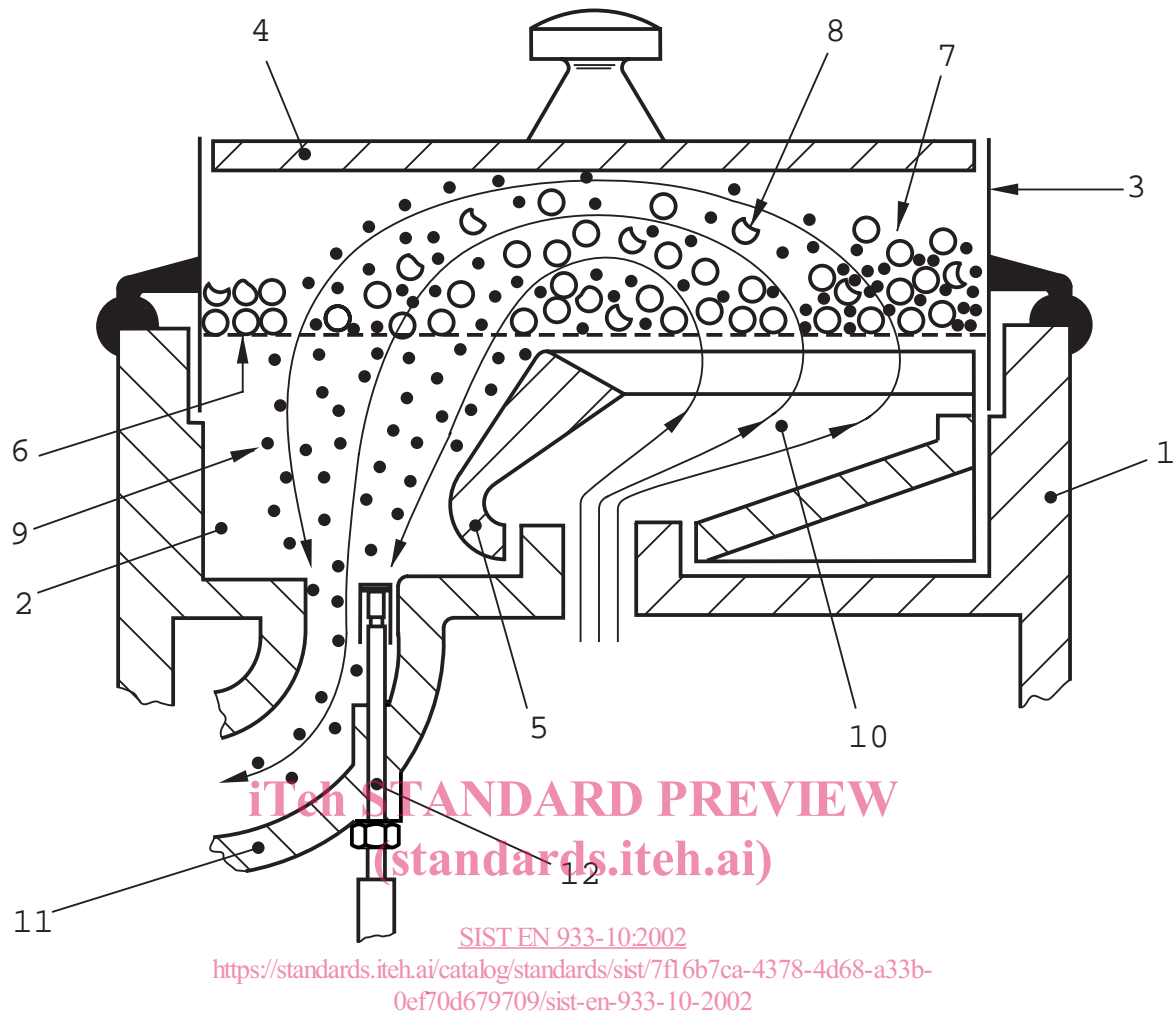
Fit the 0,063 mm test sieve onto the apparatus and transfer all of the test portion onto the sieve.

After covering the sieve with the plexiglass lid, operate the air jet sieving apparatus until complete sieving is achieved. A minimum of 3 min is required. During sieving the pressure difference to normal air pressure in the air jet sieving apparatus shall be $(3,0 \pm 0,5)$ kPa.

NOTE 1 Any agglomeration of particles during sieving can be alleviated by tapping the plastic hammer at the centre of the plexiglass lid.

NOTE 2 The sieving process is complete when the mass of retained material does not change more than 0,1 % of the mass of the test portion during one minute of this sieving operation.

NOTE 3 In many cases sieving can be completed after sieving for a pre-determined time. Test laboratories can determine the time required to fulfil the requirements of clause 7 for completion of sieving for specific types and sizes of test portions in the air jet sieving apparatus used.

**Key**

- | | |
|------------------------|--|
| 1 Housing | 7 Test portion |
| 2 Dish | 8 Oversize material |
| 3 Sieve frame | 9 Undersize material |
| 4 Plexiglass lid | 10 Air jet |
| 5 Rotating slit-nozzle | 11 Air discharge |
| 6 Test sieve | 12 Pressure gauge socket, with dust hood |

Figure 1 – Example of air jet sieving apparatus

Determine the mass of material retained on the sieve including the filler brushed from the sieve mesh and record the mass as R_1 to 0,1 g.

Repeat the above procedure with the 0,125 mm sieve and then with the 2 mm sieve, using in each case the retained material from the previous sieve and record the masses retained as R_2 and R_3 respectively to 0,1 g.

8 Calculation and expression of results

Record the various masses on a test data sheet, an example of which is given in annex A.

Calculate the mass retained on each sieve as a percentage of the original dry mass M_1 to the nearest whole number.

Calculate the cumulative percentage of the original dry mass passing each sieve down to the 0,063 mm test sieve.

NOTE A statement on the precision of this test is given in annex B.

9 Test report

9.1 Required data

The test report shall include the following information:

- a) reference to this European Standard;
- b) identification of the sample;
- c) identification of the laboratory;
- d) cumulative percentage of the mass of the test portion passing each of the sieves to the nearest whole number;
- e) date of reception of sample;
- f) sampling certificate, if available.

9.2 Optional data

The test report can include the following information:

- a) name and location of the sample source;
- b) description of the material and of the sample reduction procedure;
- c) mass of test portion;
- d) graphical presentation of results (See annex C);
- e) date of test.