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Interested committees:

Title: Draft BS EN 933-1 Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method

Essais pour déterminer les caractéristiques
géométriques des granulats - Partie 1 : Détermination
de la granularité - Analyse granulométrique par
tamisage

Prüfverfahren für geometrische Eigenschaften von
Gesteinskörnungen - Teil 1: Bestimmung der
Korngrößenverteilung - Siebverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 154.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 933-1:2021) has been prepared by Technical Committee CEN/TC 154 “Aggregates”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 933-1:2012.

In comparison with the previous edition, the following technical modifications have been made:

- a) The European foreword, the Scope, the Terms and definitions and the Test report content have been updated according to the current rules;
- b) Normative references to ISO 3310-1 and ISO 3310-2 have been deleted. The ISO standards are referenced in EN 933-2;
- c) Clauses 3 Terms and definitions and 5 Apparatus have been extended;
- d) Clause 6 Preparation of test portions has been clarified. Notes have been transformed to main text and text about recycled aggregates has been added;
- e) Clause 7 Procedure has been clarified. Text about dry sieving of lightweight aggregates has been added, notes have been transformed into main text and recommended masses to avoid overloading of sieves have been moved to an annex;
- f) In Clause 8 Calculations, the formula for dry sieving has been clarified to only apply for lightweight aggregates. Masses are expressed in grams instead of kilograms. The former subclause 8.3 about precision has been moved to an annex;
- g) In Clause 9, the list of required data has been supplemented with drying temperature;
- h) Annex A has been revised with a new title and text and has been transformed from normative Annex A to informative Annex B;
- i) Former Annex B has been transformed to new Annex A and has been provided with a new title;
- j) A new Annex C (informative) has been designed to give guidance on the maximum mass to avoid overloading of sieves;
- k) A new Annex F Precision (informative) has been added;
- l) Clause 4 Principle and Annex D have been adjusted and the Bibliography is supplemented.

This document forms part of a series of tests for geometrical properties of aggregates. Test methods for other properties of aggregates are covered by the following European Standards:

- EN 932 (all parts), *Tests for general properties of aggregates*
- EN 1097 (all parts), *Tests for mechanical and physical properties of aggregates*
- EN 1367 (all parts), *Tests for thermal and weathering properties of aggregates*
- EN 1744 (all parts), *Tests for chemical properties of aggregates*
- EN 13179 (all parts), *Tests for filler aggregate used in bituminous mixtures*

The other parts of EN 933 include:

- *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 particles in coarse and all-in natural aggregates*
- *Part 6: Assessment of surface characteristics — Flow coefficient of 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*
- *Part 10: Assessment of fines — Grading of filler aggregates (air jet sieving)*
- *Part 11: Classification test for the constituents of coarse recycled aggregate*

1 Scope

This document specifies the reference method used for type testing and in case of dispute, for determination of the particle size distribution of aggregates, by washing and dry sieving. Other methods can be used for other purposes, such as factory production control, provided that an appropriate working relationship with the reference method has been established.

This document applies to all aggregates, with an upper aggregate size D up to 90 mm, but excluding added filler aggregates.

NOTE The determination of the grading of fillers is specified in EN 933-10 [1].

Annex A specifies a test method for aggregates unsuitable for oven-drying.

Annex B specifies additional steps for preparation of the test portion for all-in aggregates with $D \geq 31,5$ mm, without washing size fractions greater than 16 mm.

Annex C provides guidance for maximum mass on sieves to avoid overloading.

Annex D provides an example of test data sheet.

Annex E provides a sheet for graphical presentation of test results.

Annex F gives precision data.

Annex A is normative and Annexes B, C, D, E and F are informative.

WARNING – The use of this part of EN 933 can involve hazardous materials, operations and equipment (such as dust, noise and heavy lifts). It does not purport to address all of the safety or environmental problems associated with its use. It is the responsibility of users of this document to take appropriate measures to ensure the safety and health of personnel and the environment prior to application of the standard, and fulfil statutory and regulatory requirements for this purpose.

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.

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.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

aggregate

granular material used in construction which may be natural, manufactured or recycled

3.2

aggregate size

d/D

designation of aggregate in terms of lower (d) and upper (D) sieve sizes

Note 1 to entry: This designation accepts the presence of some particles which will be retained on the upper sieve (oversize) and some which will pass the lower sieve (undersize).

3.3

test portion

d_0/D_0

sample used as a whole in a single test

3.4

constant mass

mass determined by successive weighings during drying 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 5.3) at $(110 \pm 5) ^\circ\text{C}$. 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 washing, dividing and separating a material into several particle size classifications of decreasing sizes by means of a series of sieves.

Successive steps are: initial washing to remove most of the fines in the test sample, drying, and dry sieving to separate the test sample into several size fractions of decreasing sizes. This is done by means of a series of selected sieves.

The mass of the particles retained on the various sieves is related to the initial dry mass of the test sample. The cumulative percentages passing each sieve are then calculated.