SLOVENSKI STANDARD
oSIST prEN 932-3:2020

01-november-2020

Preskusi splošnih lastnosti agregatov - 3. del: Postopek in izrazje poenostavljenega petrografskega opisa

Tests for general properties of aggregates - Part 3: Procedure and terminology for simplified petrographic description

Prüfverfahren für allgemeine Eigenschaften von Gesteinskörnungen - Teil 3: Durchführung und Terminologie einer vereinfachten petrographischen Beschreibung

Essais pour déterminer les propriétés générales des granulats - Partie 3 : Procédure et terminologie pour la description pétrographique simplifiée

Ta slovenski standard je istoveten z: **prEN 932-3**

ICS:

91.100.15	Mineralni materiali in izdelki	Mineral materials and products

oSIST prEN 932-3:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 932-3

September 2020

ICS 91.100.15

Will supersede EN 932-3:1996

English Version

Tests for general properties of aggregates - Part 3: Procedure and terminology for simplified petrographic description

Essais pour déterminer les propriétés générales des granulats - Partie 3 : Procédure et terminologie pour la description pétrographique simplifiée

Prüfverfahren für allgemeine Eigenschaften von Gesteinskörnungen - Teil 3: Durchführung und Terminologie einer vereinfachten petrographischen Beschreibung

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.

CEN members are the national standards bodies of 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

Contents

Page

European foreword 3
1 Scope 4
2 Normative references 4
3 Terms and definitions 4
4 Reagent and apparatus 5
5 Laboratory sample 6
5.1 General 6
5.2 Massive rock sample 6
5.3 Unconsolidated rock sample 6
5.4 Laboratory sample taken directly on aggregates 6
6 Test procedure 6
6.1 Description of a massive rock sample 6
6.1.1 Examination and description 6
6.1.2 Designation 6
6.2 Description of an aggregate sample 7
6.2.1 General 7
6.2.2 Examination and description of test portion 7
6.2.3 Designation 7
7 Test report 8
7.1 Required data 8
7.2 Optional data 8
Annex A (informative) Nomenclature 9
A.1 General 9
A.2 Igneous rocks 9
A.3 Sedimentary rocks 12
A.4 Metamorphic rocks 13
A.5 Sediments or unconsolidated rocks 14
A.6 Mineral ore 14
Bibliography 15

European foreword

This document (prEN 932-3:2020) 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 932-3:1996.

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

a) The Scope has been revised;

b) Clauses 3 Terms and definitions and 4 Reagent and apparatus have been extended;

c) Clauses 5, 6 and 7 have been revised with new title, structure and texts;

d) Test report has been revised;

e) Annex A has been updated;

f) The Foreword, Normative references and Bibliography have been partly updated.

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

— EN 933 (all parts), *Tests for geometrical 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 932 include:

— *Part 1: Methods for sampling*

— *Part 2: Methods for reducing laboratory samples*

— *Part 5: Common equipment and calibration*

— *Part 6: Definitions of repeatability and reproducibility*

1 Scope

This document specifies a basic procedure for the identification of the petrographic type of natural aggregates. Precise petrographic identification, of technical mineralogy and petrography for civil engineering or specific end uses, requires further examination and is therefore excluded from the scope of this document.

NOTE 1 A qualified geologist (petrographer), with experience of materials used in civil engineering and aware of the composition of the deposit, has sufficient skills to sample and name the rock.

NOTE 2 For precise petrographic identification, a non-exhaustive list of reference literature is given in the Bibliography.

This document covers only natural aggregates. It is used to describe massive rocks and unconsolidated rocks.

Annex A provides guidance on the petrographic nomenclature by giving definitions of simple petrographic terms applicable to rock types used for aggregates.

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

EN 933-1, *Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method*

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 http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
massive rock
rock consisting of consolidated mineral phases. Massive rocks can be classified into three major petrographic types, according to their origin: igneous, sedimentary and metamorphic

3.2
unconsolidated rock
rock consisting of individual particles, e.g. alluvial or natural lightweight rock. Unconsolidated rocks can be classified into three major petrographic types, according to their origin: igneous, sedimentary and metamorphic

3.3
igneous rock
rock formed from molten rock (magma) either at or below the earth's surface. The latter can be divided into two classes, plutonic and hypabbysal. Plutonic rocks are formed at depth in large bodies and typically have a coarse crystalline texture, with crystals clearly visible to the naked eye. Hypabyssal rocks are formed in smaller bodies near, but not at, the earth's surface and have usually a fine crystalline texture. Extrusive or volcanic rocks are formed as lavas and pyroclastics at the earth's surface and have a very fine or glassy texture

3.4
sedimentary rock
indurated rock formed at the earth's surface by the accumulation, or precipitation, of the products of weathering and erosion of existing rocks. They can also be formed by the accumulation of organic debris. Such accumulated material can remain unconsolidated or it can be lithified into rock. Sedimentary rocks are usually layered

3.5
metamorphic rock
rock formed from pre-existing rocks by the action of heat and/or pressure in the earth's crust, which has caused mineralogical and structural transformations. Metamorphic rocks frequently have anisotropic texture

3.6
natural lightweight aggregate
aggregate with a particle density not exceeding 2000 kg/m³ or a loose bulk density not exceeding 1200 kg/m³

3.7
laboratory sample
sample intended for laboratory testing

3.8
test portion
sample used as a whole in a single test

3.9
gravel
an unconsolidated, natural accumulation of typically rounded rock particles resulting from erosion

The gravel particles are often rounded, (e.g. from alluvial deposits), but they can also be angular to sub-rounded in shape (e.g. from moraine deposits)

4 Reagent and apparatus

4.1 **Test sieve**, 4 mm, conforming to EN 933-2

4.2 **Handlens**

4.3 **Pen knife**

4.4 **Stereoscopic microscope**, (magnification: typically 10X to 100X)

4.5 **Polarizing microscope**, optional

4.6 **Reagent**, diluted hydrochloric acid

4.7 Magnet, optional

5 Laboratory sample

5.1 General

The laboratory sample shall be taken either from exposed faces of quarries or drill cores, or from stock piles for aggregates.

5.2 Massive rock sample

In the case of a massive rock sample, the mass of a laboratory sample for the examination shall be not less than 5 kg.

5.3 Unconsolidated rock sample

In the case of unconsolidated rock, the testing will be done on aggregates. The sampling of aggregates shall be carried out according to EN 932-1.

5.4 Laboratory sample taken directly on aggregates

The minimum mass of the laboratory sample depends on the aggregate size *D*, and shall be determined by sieving according to EN 933-1.

6 Test procedure

6.1 Description of a massive rock sample

6.1.1 Examination and description

First, examine the sample visually to determine the constituent rock or mineral types.

NOTE 1 It can be appropriate to wash the sample before examination.

Then, inspect each rock type carefully using a handlens or a stereoscopic microscope and other appropriate means.

Describe the sample and include the following:

a) grain size of the main constituents, texture, anisotropy, porosity, vesicularity (in volcanic rocks) and colour;

b) main minerals that can be identified (quartz, feldspars, calcite, dolomite, etc.);

c) state of alteration and weathering.

NOTE 2 The description can also include comments on the presence, even in small quantities, of some constituents which can be of concern in particular circumstances (such as opal, micas or other phyllosilicates, sulphates, iron sulphides and organic materials).

6.1.2 Designation

From the examination specified in 6.1.1, assign if possible, an appropriate name to the rock, preferably selected from the nomenclature given in Annex A.

6.2 Description of an aggregate sample

6.2.1 General

Aggregates derived from natural deposits consist mainly of:

a) mineral particles;

b) rock fragments.

The methods of examination and description in 6.2.2 as well as the designation described in 6.2.3 shall be used only for particle sizes between 0,1 mm and 63 mm.

NOTE It can be appropriate to wash the sample.

6.2.2 Examination and description of test portion

Particles retained on a 4 mm sieve may be examined with the naked eye, or preferably with a handlens or stereoscopic microscope. For finer grains, the stereoscopic microscope shall be used.

NOTE In some cases, other methods can be used (e.g. magnet for identification of the presence of magnetic particles, acid test for the calcite identification, X-ray diffraction, thin sections for the examination by means of a polarizing microscope). One method for the preparation and examination of thin sections is described in detail in EN 12407 (more than one section can be necessary if the rock is coarse-grained or heterogeneous).

The description shall include:

a) the shape, surface conditions (roughness, etc.) and roundness of particles;

b) a petrographic identification based on counting a sufficiently representative number of particles.

6.2.3 Designation

6.2.3.1 General

When a petrographic type or mineral is predominant (more than 50 %), its presence shall be reflected in the name of the material. For example:

— quartzose sand (sand in which more than 50 % of the grains are quartz grains);

— basaltic gravel (gravel in which more than 50 % of the particles consist of basalt fragments).

When no single petrographic type or mineral is predominant, the material is said to be “heterogeneous” and its name should include the most frequent type(s). For example:

— quartzo-feldspathic sand;

— siliceous gravel.

6.2.3.2 Individual particles in an aggregate

The designation shall include the following:

a) petrographic type;

NOTE Informative Annex A contains a nomenclature of the most types of rock used for aggregates.

b) minerals, e.g. quartz, feldspars, micas, calcite;

c) shell fragments.

7 Test report

7.1 Required data

The test report shall include the following information:

a) reference to this document, including its year of publication;

b) identification of the test sample, including the origin of the sample;

c) identification of the laboratory;

d) date of test;

e) petrographic description, according to 6.1 for massive rocks and 6.2 for aggregates;

f) deviations from the reference method, if any;

g) any unusual features observed.

7.2 Optional data

The test report can include the following information:

a) reference to the chosen sampling procedure;

b) reference to the chosen sample reduction procedure;

c) mass of the rock sample or test portion;

d) geological information on source, i.e. on sample origin as follows:

   1) The type of formation, in the case of a sand and gravel deposit. The deposit should be characterized as alluvium, beach deposit, slope scree, till, glaciofluvial deposit, etc.;

   2) The name of the corresponding river, in the case of the quaternary alluvial formations;

   3) The geological age, if known, using one of the following terms:

      — Precambrian;

      — Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian;

      — Triassic, Jurassic, Cretaceous;

      — Tertiary;

      — Quaternary.

e) sampling report, if available;

f) reception date if different from the sampling date;

g) other influencing parameters.