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Metode preskušanja cementa - 7. del: Metode odvzemanja in priprave vzorcev cementa

Methods of testing cement - Part 7: Methods of taking and preparing samples of cement

Prüfverfahren für Zement - Teil 7: Verfahren für die Probenahme und Probenauswahl von Zement

Méthodes d'essai des ciments - Partie 7: Méthodes de prélèvement et d'échantillonnage du ciment

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English Version

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This European Standard was approved by CEN on 24 October 2007.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 196-7:2007) has been prepared by Technical Committee CEN/TC 51 Cement and building limes”, the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.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 196-7:1989.

The text in this edition has been edited to take account of developments in European Standards for cement, methods of testing cement and specifications for conformity evaluation. No technical changes have been made to the text of EN 196-7:1989.

The main editorial changes are:

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- a) Brief history has been deleted as it was no longer relevant;
 - b) ‘Object and field of application’ is now re-titled ‘Scope’;
 - c) References not normatively listed within the document have been deleted from clause 2;
<https://standards.iteh.ai/catalog/standards/sist/8857b8bf-877f-4ad7-ac88-c011-f0b010101010/EN-196-7-1989>
 - d) Clause 3.8 reference to ‘certification regulations’ has been deleted as this is now covered in EN 197-2 and Annex ZA of EN 197-1:2000;
 - e) Clause 4.2 (previously 4.1) reference to additional equipment has been deleted as it is now covered in EN 197-2 and in guidance document PD CR 14245;
 - f) Reference to responsibility regarding sampling (previously clause 4.3) has been deleted as it is now covered in EN 197-2
 - g) Clause 5 restriction to sampling whilst fluidized has been deleted since many modern samplers operate satisfactorily in such circumstances;
 - h) Clause 6 (previously 6.7) reference to sampling from bag filling machines has been deleted as being in conflict with the requirements in many specifications for only filled bags to be sampled;

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 European Standard describes the equipment to be used, the methods to be followed and the provisions for taking samples of cement, representative of given lots for testing, to assess the quality of products prior to, during or after delivery.

The provisions of this standard are only applicable when samples of cement are:

- a) required for evaluating the conformity of a cement at any time with a standard; or
- b) requested for checking a delivery or a lot with a standard, the provisions of a contract or the specification in an order.

The standard is applicable to the taking of samples of all types of cements defined by European Standards for cements whether they are:

- c) contained in silos;
- d) contained in bags, canisters, drums or any other packages;
- e) transported in bulk in road vehicles, railway wagons, ships, etc.

NOTE The requirements of this standard can also, by agreement between the parties, be followed for acceptance inspections for all non-standardized hydraulic binders.

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2 Normative references (standards.iteh.ai)

Not applicable.

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3 Terms and Definitions

For the purpose of this European Standard, the following terms and definitions apply.

3.1

order

quantity of cement covered by a single requisition placed with a single manufacturer, factory, depot or dispatching centre. It may consist of one or more consignments spread over a period of time

3.2

consignment

quantity of cement delivered at a given time by a single manufacturer, factory, depot or dispatching centre. It may consist of one or more lots

3.3

lot

quantity of cement produced under conditions presumed uniform

NOTE After specified tests this quantity is regarded as a whole as meeting or not meeting a standard, the provisions of a contract or the specification in an order.

3.4

increment

quantity of cement taken in a single operation of the sampling equipment used

3.5**sample**

quantity of cement taken at random, or in accordance with a sampling plan, from a larger quantity (silo, stock of bags, wagons, trucks, etc.) or from a fixed lot, relating to the intended tests. A sample may consist of one or more *increments*

3.6**spot sample**

sample taken within a short period of time and at a fixed point from within a larger quantity, relating to the intended tests. It can be obtained by combining one or more immediately consecutive *increments*

3.7**composite sample**

homogeneous mixture of *spot samples* taken:

- a) at different points; or
- b) at different times;

from a larger mass of the same cement, obtained by thoroughly mixing the combined spot samples and, if necessary, reducing the size of the resulting mixture

3.8**laboratory sample**

sample prepared by thoroughly mixing and if necessary reducing from a larger sample (spot or *composite sample*) and intended for use by laboratories undertaking the tests

3.9**sample for retest**

sample which is to be kept for possible subsequent tests in the event of the results from tests carried out on laboratory samples being in doubt or disputed

3.10**retained sample**

sample taken systematically from regular deliveries (for example for large works), if necessary in the presence of all the parties concerned, to be retained for possible testing in the event of doubt or dispute or subsequent problems

NOTE Definitions 3.1, 3.2, 3.3 and 3.10 only have meaning in the case of checks made when taking delivery of a supply.

4 General**4.1 Purpose**

The purpose of the sampling operations is to obtain from a large quantity of cement (contained in a silo, a stock of bags in a warehouse, truck, etc., or in a defined lot), one or more smaller quantities, considered by the parties concerned to represent the quantity of cement of which the quality is to be assessed.

4.2 Equipment

The equipment used, methods followed, and precautions taken may vary according to the nature of the installation and the circumstances in which the samples are taken.

4.3 Representation

In the case of taking delivery of supply, sampling should take place in the presence of representatives of the manufacturer (or vendor) and the customer (or purchaser). The absence of one of them should not, however, be a barrier to sampling but if this occurs it should be recorded in the sampling report (see clause 10).

The sample is normally taken before or during discharge or unloading. However, if necessary, it may be taken after discharge or unloading but with a maximum delay of 24 h. In this latter case the results of the checks shall be interpreted with care.

NOTE For various reasons, the cement to be tested may no longer be representative of the product at the time of its discharge or unloading, when a delay in sampling occurs.

In all cases, the time of sampling shall be recorded in the sampling report (see clause 10). When samples are taken after discharge or unloading, the recommendations in the first paragraph above remain applicable.

5 Sampling equipment

Industrial installations and the circumstances in which samples have to be taken are many and diverse. Consequently, it is not possible to specify a single type of reference equipment against which other types can be validated. Hence, this standard only gives, by way of example in Annex A, a simplified illustration of the devices normally used and which have been found to be satisfactory. This equipment is either portable (ladle, tube, screw sampler, etc.) or permanently installed (screw extractor or other equipment fixed permanently onto the container).

The equipment shall be chosen and used in accordance with the following requirements.

The equipment shall be:

- a) approved by all the parties;
- b) of non-corrodible material, which is not liable to react with the cement;
- c) maintained always in working order and in a clean state. Care shall be taken to ensure that it is carefully cleaned after each sampling operation (see Note). Care shall also be taken to ensure that it is not contaminated by lubricants from other equipment used.

NOTE However, cleaning is not necessary between taking successive increments from the same cement which are intended for making up the sample.

6 Procedures for taking samples

6.1 General

The most suitable equipment for the circumstances shall be used to take a sample, observing the following precautions as appropriate.

6.2 Sampling from bags, drums and containers of small size

When the cement is packed in bags, drums or other small containers, the sample shall comprise one or more bags, drums or containers chosen at random from a sufficiently large stock in order to meet the requirements of the second paragraph of 8.1.

6.3 Sampling from large containers and bulk transport (after loading or before unloading)

For all equipment used, care shall be taken not to take material from the top or bottom layers of the mass of cement. The thickness of the layer to be considered is at least 15 cm.

Precautions to be taken include:

- a) not to operate in dusty or polluting atmospheres;
- b) take the number of samples necessary to obtain the quantity prescribed in the second paragraph of 8.1;
- c) transfer the collected cement into clean, dry and airtight containers before proceeding with the operations described in clause 8.

NOTE The equipment described in this standard (see Annex A) does not allow for sample(s) to be taken during unloading.

6.4 Sampling while loading into bulk transports or silos

Sampling may be carried out only if suitable equipment is available and if there is access to a homogeneous phase of cement. Take the same precautions as those described in 6.3a), b) and c).

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6.5 Sampling from silos

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When sampling from a silo, an appropriate quantity of cement shall be discarded to remove the hard deposits or unwanted mixtures of different cements that may be in the distribution system. The quantity to be discarded is at the discretion of the manufacturer's representative present during the sampling operation. The necessary quantity prescribed in the second paragraph of 8.1 shall then be collected in clean and dry containers.

7 Frequency at which samples are taken and choice of sample type

The frequency of taking samples and the type of sample (spot sample or composite sample) depends on the provisions in:

- agreements between producer and customer;
- national or European Standard.

8 Size and preparation of samples

8.1 Size of sample to be taken

Each laboratory sample (or sample for retest or retained sample) shall be of such a size that all the tests wherever specified can be carried out twice.

NOTE In general, laboratory samples of at least 5 kg in mass tend to be sufficient but more may be needed to completely fill the container indicated in 9.2.

The total quantity (spot sample or composite sample) to be taken shall be greater than or at least equal to that required for supplying to all the laboratories concerned, the samples indicated in the first paragraph above. This quantity shall be taken using the equipment specified in clause 5 and in accordance with the procedures stated in clause 6.

Spot samples, taken by the manufacturer, that are to be tested at a single laboratory may be exempted from the homogenization procedures given in 8.2 and 8.3.

8.2 Homogenization

8.2.1 General requirements

As soon as the sample indicated in the second paragraph of 8.1 has been obtained, it shall be carefully homogenized (preferably in a laboratory) with clean dry implements not liable to react with the cement.

Homogenization shall be achieved using a suitable mixing machine where available.

In the absence of a mixing machine, the following procedure is to be adopted:

quantity of cement to be homogenized (see the second paragraph of 8.1) shall be tipped onto a clean dry cloth (or plastics sheet) and shall then be mixed carefully using a shovel.

This procedure shall only be used if:

- a) ambient relative humidity is less than 85 %;
- b) all risks of the sample being affected by wind, rain, snow or dust are avoided.

Whatever procedure is chosen, its efficiency shall have been demonstrated (see 8.2.2) and it shall also be carried out as quickly as possible to minimize the exposure of the cement to the air.

8.2.2 Verification of the efficiency of homogenization

Take approximately equal quantities of two cements of differing physical or chemical characteristics (e.g. Blaine fineness, by EN 196-6, and optionally colour).

NOTE To obtain the initial information, the colour of these micro-samples can be compared if care has previously been taken to select two cements of distinctly different colours.

Mix these using one of the procedures described in 8.2.1 and note the time between starting and finishing the operation. Once the operation is judged to be complete, take 15 micro-samples, each between 12 g to 20 g, from points equally distributed within the mass of which the homogeneity is to be verified.

Determine the chosen characteristic three times on each of these micro-samples.

Homogenization shall be considered to be achieved if the analysis of variance shows there to be no significant differences between the 15 micro-samples.

In the case of an unsatisfactory result, appropriate steps shall be taken to achieve homogenization, e.g. mixing time may be extended.

For a given procedure, the verification of homogenization shall be carried out only once at the time of choosing the procedure and records of satisfactory performance shall be retained.

8.3 Division of the homogenized sample

Immediately after homogenization (see 8.2) of the sample, it shall be divided into the required number of laboratory or retained samples by one of the two following procedures:

- a) in the case where a mixing machine has been used, the required number of containers may be filled directly from the homogenized sample;
- b) in the case where a mixing machine was not available, then the required number of laboratory or retained samples shall be prepared either by using a sample divider or, after quartering the quantity to be distributed, by extracting with a hand scoop increments of approximately 0,5 kg from each of the quarters and transferring these successively into containers prepared for receiving the laboratory (or retained) samples. This operation shall be continued until the desired mass (indicated in the Note to the first paragraph of 8.1) is obtained in each container.

The sequence of distributing the contents of the hand scoop from which each laboratory sample is gradually made up shall be as follows.

Distribute successively to each of the laboratory containers X, Y, Z, etc.

first a scoopful from A, [SIST EN 196-7:2008](https://standards.iteh.ai/catalog/standards/sist/8857b8bf-877f-4ad7-ac88-ceda11f6dbf4/sist-en-196-7-2008)
 then a scoopful from B,
 then a scoopful from C,
 then a scoopful from D.

This represents one distribution sequence; repeat the same sequence as many times as necessary to reach the quantity indicated in Note in the first paragraph of 8.1 (see Figure 1, e.g. for a 50 kg sample).

Each laboratory (or retained) sample shall be packaged as stated in clause 9 and dispatched with minimum delay. It is then a matter for the receiving laboratory, to store, prepare and treat the sample in a manner appropriate to its subsequent use.

NOTE At this point the work of the laboratory has usually been specified by reference to European Standards for testing cement.