PD CEN/TR 14245:2020

BSI Standards Publication

Cement – Guidelines for the application of EN 197-2: Assessment and verification of constancy of performance

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National foreword

This Published Document is the UK implementation of CEN/TR 14245:2020. It supersedes PD CEN/TR 14245:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/516, Cement and lime.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Zement - Richtlinien für die Anwendung der EN 197-2: Bewertung und Überprüfung der Leistungsbeständigkeit

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Contents

Page

European foreword 4
Introduction to this Guidelines Document 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 Factory production control 10
4.1 General requirements 10
4.1.1 Concept 10
4.1.2 Works' quality documentation 10
4.1.3 Quality management system 11
4.1.4 System of documentation 13
4.2 Internal quality control 14
4.2.1 Process control 14
4.2.2 Measuring and testing 16
4.2.3 Handling, storage, packaging and delivery 17
4.3 Autocontrol testing of samples 17
4.3.1 Sampling and testing 17
4.3.2 Corrective action 19
4.3.3 Measuring and test equipment for autocontrol testing 21
4.3.4 Quality records 21
5 Tasks for the purpose of certification 21
5.1 Assessment of the performance of the cement 21
5.2 Initial inspection of the manufacturing plant and of factory production control 22
5.2.1 Inspection of a new factory 22
5.2.2 Inspection of an existing factory 22
5.2.3 Criteria for the assessment of the production equipment 23
5.2.4 Criteria for the assessment of laboratories 23
5.3 Continuing surveillance, assessment and evaluation of factory production control 23
5.3.1 Inspection of the factory and the factory production control 23
5.3.2 Evaluation of the results of autocontrol testing of samples 25
5.4 Audit-testing of samples taken at the factory/depot 29
5.4.1 Sampling 29
5.4.2 Testing 30
5.4.3 Evaluation of test results 31
5.5 Reports 31
5.6 Actions to be taken in the event of non-conformity 32
5.6.1 Following inspection of the factory production control and evaluation of the results of autocontrol testing 32
5.6.2 Following evaluation of the results of the audit-testing 33
6 Procedure for certification of constancy of performance of the product 33
Annex A (normative) Evaluation of the representativeness and the accuracy of the 28 day strength test results 36
A.1 General 36
A.2 Sets of results considered 36

Documents
Document Sharing Hub
Full document details: PD CEN/TR 14245:2020

A.3 Evaluation procedure 36
A.3.1 Introduction 36
A.3.2 Symbols 36
A.3.3 Evaluation of whether set A and set B belong to the same population (sampling error check) 37
A.3.4 Comparison between set B and set C in order to check the accuracy of the autocontrol testing (testing error check) 38
A.3.5 Masonry cement 38
A.3.6 Calcium aluminate cement 38
Annex B (informative) Procedure for certification of constancy of performance of cement 39
Bibliography 40

Documents
Document Sharing Hub
Full document details: PD CEN/TR 14245:2020

European foreword

This document (CEN/TR 14245:2020) has been prepared by Technical Committee CEN/TC 51 “Cement and building limes”, the secretariat of which is held by NBN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TR 14245:2014.

Compared with CEN/TR 14245:2014, the following changes have been made:

— The Guidelines Document follows the changes made in EN 197-2;

— Guidance relating to AVCP for distributors and importers has been inserted in the Guidelines Document.

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Full document details: PD CEN/TR 14245:2020

Introduction to this Guidelines Document

Purpose

The purpose of this document is to provide explanatory detail on points not fully elaborated in EN 197-2. It is intended for use by all parties involved in the certification of cement following EN 197-2.

It is an objective of this Guidelines Document that its use will assist in the establishment of equivalent procedures for certification of cement. It is expected that, following this document, traditional good procedures and practices that can be different can continue to be used, provided that they are not in contradiction with EN 197-2 and the relevant product specification standard. Such existing good procedures and practices, applied in conjunction with these Guidelines, are not considered to be an impediment to the achievement of the uniform level of certification throughout Europe, and by different product certification bodies.

This document is based on existing situations for production, assessment and verification of constancy of performance of cements. In case of situations different to those included in this document, specific procedures should be elaborated on a case by case decision and be fully recorded and approved. These specific procedures should always fulfil the specifications given in EN 197-1 and EN 197-2 and lead to the same level of confidence in product that would be achieved by application of this document.

Arrangement

The clause numbering system of EN 197-2 is followed. The text of each of the clauses of the European Standard is reproduced in full and is followed by guidance, which is provided only for those clauses where clarification or elaboration is needed.

Clauses of EN 197-2

1 Scope

2 Normative references

3 Terms and definitions

4 Factory production control

5 Tasks for the purpose of certification

6 Procedure for certification of constancy of performance of the product

Table 1

Annexes A and B

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Document Sharing Hub
Full document details: PD CEN/TR 14245:2020

1 Scope

This document specifies the scheme for the assessment and verification of constancy of performance (AVCP) of cements, including certification of constancy of performance.

The document provides technical rules for factory production control, further testing of samples taken at the manufacturing plant (autocontrol testing) and assessment of the performance of the cement, initial inspection of the manufacturing plant and of factory production control, continuing surveillance, assessment and evaluation of factory production control and audit-testing of samples. It also provides rules for actions to be followed in the event of non-conformity and requirements for depots.

In this document, the word "cement" is used to refer both to common cements as defined in EN 197-1 and to other cements and binders for which the relevant product specification standard makes reference to this document and which are submitted for certification. Such a cement is produced at a given factory and belongs to a particular type and a particular strength class, as defined and specified in the relevant product specification standard.

The guidelines given in the Technical Report CEN/TR 14245 contain information for the application of this document.

This document is linked with Annexes ZA of European Standards covering cements and binders, i.e. EN 197-1, EN 14216, EN 14647, EN 413-1 and EN 15743.

NOTE The reason for having drafted this separate document is that the provisions it includes are applicable to different products covered by different European Standards.

Guidance

EN 197-2 deals with the assessment and verification of constancy of performance (AVCP) of cements and binders that are submitted for certification. It deals in particular with cases where "further testing" of the product is undertaken, as is the case for attestation system 1+ under the Construction Products Regulation. The products for which EN 197-2 is applicable are: the common cement products and the low heat cements and the sulfate resisting cements, refer to EN 197-1, the very low heat special cements, refer to EN 14216, the supersulfated cements, refer to EN 15743, the calcium aluminate cements, refer to EN 14647, and the masonry cements, refer to EN 413-1.

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 196-7, *Methods of testing cement — Part 7: Methods of taking and preparing samples of cement*

EN 197-1, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

EN 413-1, *Masonry cement — Part 1: Composition, specifications and conformity criteria*

EN 14647, *Calcium aluminate cement — Composition, specifications and conformity criteria*

EN 15743, *Supersulfated cement — Composition, specifications and conformity criteria*

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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 http://www.iso.org/obp

NOTE In the context of this document the term "construction product" refers to cement.

3.1
AVCP
abbreviation for assessment and verification of constancy of performance

3.2
certificate of constancy of performance of the product
document issued under the rules of the scheme for the AVCP indicating that adequate confidence is provided that the cement conforms to the performance(s) declared in accordance with the relevant product standard

Guidance

The term "certificate of constancy of performance of the product" refers to certificates of constancy of performance of the product issued by a product certification body under the rules of the Construction Products Regulation and EN 197-2.

3.3
initial period
immediate period starting after the first issuing of the certificate of constancy of performance of the product for a cement and at the latest from the first dispatching of cement

3.4
factory production control
documented, permanent and internal control of production in a factory, in accordance with the relevant harmonized technical specifications

[SOURCE: Regulation (EU) No 305/2011, Article 2 (Construction Product Regulation)[3]]

3.5
factory
facility used by a manufacturer for the production of cement using equipment which is suitable for continuous mass production of cement including, in particular, equipment for adequate grinding and homogenization and the necessary silo capacity for the storage and dispatch of each cement produced

Note 1 to entry: This equipment and the production control applied allow the control of production with sufficient accuracy.

Documents
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Full document details: PD CEN/TR 14245:2020

Guidance

According to EN 197-1, common cements (CEM cements) consist of different materials and are statistically homogeneous in composition resulting from quality assured production and material handling processes. A high degree of uniformity in all cement characteristics is obtained through continuous mass production processes, in particular, adequate grinding and homogenization processes. Similar considerations apply for other cements.

Three categories of "factory" are recognized:

— traditional full cement factories, where clinker and cement are produced on the same site;

— grinding plants, where cement is produced by grinding supplied cement constituents;

— blending plants, where ground cement constituents, which may be received already combined as cement, are blended to produce finished cement.

The following operating steps, which apply for all of these types of factory, are essential in the manufacturing process. These steps are needed to ensure the necessary uniformity, continuity and suitability of the cement properties as well as the ability to meet the other requirements of the relevant product specification standard:

— use of separate and adequate storage for the cement constituents;

— Controlling the cement constituents – including, where relevant, their fineness and particle size distribution, and therefore their grinding – to achieve a performance of the cement compatible with the requirements of the product specification standard;

— proportioning the cement constituents in order to achieve the target composition of the cement;

— homogenization of the cement constituents by grinding, or by mixing where relevant;

— storage of finished product, in silos of adequate capacity, allowing proper identification of mass quantities of product and giving the possibility of taking spot samples at any time without prior notice.

Factories can only be operated by manufacturers which have personnel with sufficient experience and knowledge in all operating steps important for cement quality and which have the people, test procedures and test equipment to test, evaluate and correct the cement being produced. The definition of factory in EN 197-2 takes it, therefore, for granted that all operating steps listed above are carried out in effect under the same quality responsibility.

3.6
new factory
factory which is not already producing cement(s) certified using EN 197-2

3.7
existing factory
factory which is already producing cement(s) certified using EN 197-2

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Full document details: PD CEN/TR 14245:2020

3.8
depot
bulk cement handling facility not located at the factory used for the dispatch of cement, whether in bulk or bagged, after transfer or storage where the manufacturer has full responsibility for all aspects of the quality of the cement

Guidance

In the case of a depot the facility is strictly linked to the factory and is included in the factory Works' quality documentation. The manufacturer has full responsibility for the quality of the cement released from the depot. Depots are included in the Works' quality documentation. An entity other than the manufacturer may own and operate the depot but it does this on behalf of and under the strict quality management responsibility of the manufacturer.

3.9
distributor
natural or legal person in the supply chain, other than the manufacturer or the importer, who makes a construction product available on the market

[SOURCE: Regulation (EU) No 305/2011, Article 2 (Construction Product Regulation)]

3.10
importer
natural or legal person established within the European Union, who places a construction product from a third country on the European Union market

[SOURCE: Regulation (EU) No 305/2011, Article 2 (Construction Product Regulation)]

3.11
assessment of the performance
determination of the essential characteristics of a construction product, on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of the product

3.12
product certification body
body notified in accordance with Chapter VII of Regulation (EU) No 305/2011 to carry out constancy of performance certification

3.13
works' quality documentation
documentation that provides information on the factory production control which is applied by a manufacturer at a particular factory to ensure constancy of performance of the cement

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Full document details: PD CEN/TR 14245:2020

4 Factory production control

4.1 General requirements

4.1.1 Concept

Factory production control means the permanent internal control of cement production and consists of internal quality control (see 4.2) complemented by autocontrol testing of samples of cement taken at the point of release[1] (see 4.3).

NOTE 1 The requirements of this document as regards factory production control apply to factories and their depots.

NOTE 2 The requirements of this document in regards to factory production control take into account the clauses of EN ISO 9001 [1] which are relevant to the production, process control and testing of cement.

Guidance

The purpose of factory production control is to ensure that the cement is manufactured in a controlled way to meet all of the requirements of the relevant product specification standard. In order for a product certification body to verify such a system, it has to be documented in a structured way. This is carried out in a Works' quality documentation, supported and cross-referenced by a series of procedures, work instructions and other associated and relevant documents. These need to be clear, concise and adopt recommended good practices where applicable. The factory production control system may form part of a wider, integrated management system provided it can be demonstrated that all applicable EN 197-2 requirements are addressed. See also Clause 4.1.2 of the document.

4.1.2 Works' quality documentation

The manufacturer's documentation and procedures for factory production control shall be described in a Works' quality documentation, which shall adequately describe, amongst other things, for each factory and depot:

a) the quality aims and the organizational structure, responsibilities and powers of the management with regard to product quality and the means to monitor the achievement of the required product quality and the effective operation of the internal quality control (see 4.1.3 and 4.2);

b) the manufacturing and quality control techniques, processes and systematic actions that will be used (see 4.2.1, 4.2.3 and 4.3.2);

c) the inspections and tests that will be carried out before, during and after manufacture, and the frequency with which they will be carried out (see 4.2.2, 4.3.1 and 4.3.3).

The Works' quality documentation shall address and document the procedures operated to ensure that the manufactured cement conforms to the performance(s) declared in accordance with the relevant product standard. The documentation may reference associated documents which provide further details of the autocontrol testing of samples and the internal quality control. For the purpose of this scheme, the term Works' quality documentation shall be considered to include these associated documents.

1 This testing corresponds also to the "further testing of samples taken at the manufacturing plant" mentioned in Delegated Regulation (EU) No 568/2014 amending Annex V to Regulation (EU) No 305/2011 (Construction Products Regulation) [4].

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Full document details: PD CEN/TR 14245:2020

In the case of an existing quality management system according to EN ISO 9001, the corresponding quality documentation may also be applied for product certification if it meets all the requirements of this document which are relevant to the factory production control of cement.

Guidance

Illustrative example of responsibilities – For information only

The producer has three overall responsibilities:

— To have an approach for production control and testing (to ensure that adequate quality procedures exist);

— To ensure that the procedures are carried out;

— To ensure that the approach and application are giving the expected results.

Responsibility and authority for personal responsible for the quality of the product and FPC system should be clear, communicated and understood within the organization.

Examples of responsibilities that should be defined are:

— The co-ordination, monitoring and updating of the Works' quality documentation procedures;

— Ensuring all personnel at every level is kept informed of working methods, procedures, specifications and quality targets;

— Setting the requirements for process control and supervising their written transmission to the appropriate personnel;

— The system of management of corrective actions for the entire scope of the FPC system;

— Assessing the conformity of raw materials to the relevant specifications;

— Controlling of off-specification constituents and non-conforming cements;

— The identification and resolution of non-conformities in the FPC system;

— Supervising the recording and processing of relevant data and consequent approval;

— Provide the organization with periodic reports on the compliance status of the cement.

There needs to be a quality plan for the production of conforming cement and whilst it shall be recognized that the plan can take on one of many forms and include such things as process flow charts and control tables, it shall show how each of the parts of the process are connected. There shall be a clear indication of where samples are taken and at what frequency, together with the tests to be applied. Targets and acceptability criteria should also be documented.

In the case of an existing quality management system in accordance with EN ISO 9001, it should be clearly stated in the Works' quality documentation that the system is also used for factory production control according to EN 197-2 and the relevant product specification standard.

4.1.3 Quality management system

4.1.3.1 Quality policy statement

The Works' quality documentation shall include a statement by management defining its quality policy, objectives and commitments to the attainment of product quality.

Guidance

The quality policy statement is a document signed normally by the managing director of the company or by the manager of the factory, depending on the organization of the company, or by both. It should include the quality aims and its commitment to meeting the requirements of standards and/or of its customers and to ongoing improvement, both internally and externally. It

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should indicate approval of the factory production control system as outlined in the Works' quality documentation and that it is mandatory.

The system by which all personnel are informed of the quality policy should be documented. A route for feedback should be established to aid understanding of the policy.

In the case of an existing quality management system in accordance with EN ISO 9001, the quality policy statement should include a commitment to the attainment of cement quality in relation to the relevant product specification standard.

The Quality Policy should be reviewed periodically to ensure changes in aims are incorporated.

4.1.3.2 Quality manager

A quality manager shall be appointed who, irrespective of other responsibilities, shall have defined and adequate authority and responsibility for ensuring that the requirements of this document for the AVCP are implemented and maintained.

Guidance

The quality manager should be clearly shown to have the necessary dedication, time and authority to ensure that cement continues to conform to the relevant product specification standard by the adoption of the requirements of the documented factory production control system. As he has the ultimate responsibility for the effective operation of factory production control his responsibilities should at least include maintenance of the Works' quality documentation, the operation of process and autocontrol and the evaluation of the cement data to the relevant product specification standard requirements. Effective and unrestricted communication channels to other affected departments shall be open to the quality manager to discuss possible problems.

The authority and responsibility for the factory production control system and the quality assurance of cement are not necessarily held by the same person.

The Works' quality documentation should state to whom the responsibility is transferred in the absence of the quality manager.

4.1.3.3 Internal audits and management review

In order to ensure the continuing suitability and effectiveness of the Work's quality documentation to meet the requirements of this document:

a) internal audits covering the scope of this Clause 4;

b) a management review of the functioning and the results of the factory production control, taking into account records of the internal audits;

shall be performed at least once a year.

Guidance

For audits to be of value, there needs to be evidence that non-conformities raised are progressed to a satisfactory conclusion and this shall be assessed by management during the review. Reviews should be conducted to an established formal agenda by a management team and a record made of the findings, showing actions to be taken and relevant responsibilities. Reviews will need to take account of not only the internal audits but also of customer complaints.

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