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**Grobozrnata plavžna žindra za uporabo v betonu, malti in injekcijski malti – 2.  
del. Ovrednotenje skladnosti**

Ground granulated blast furnace slag for use in concrete, mortar and grout - Part 2:  
Conformity evaluation

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ICS

English version

## Ground granulated blast furnace slag for use in concrete, mortar and grout - Part 2: Conformance evaluation

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 104.

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.

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COMITÉ EUROPÉEN DE NORMALISATION  
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## Contents

Page

Foreword .....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions .....	4
4 Tasks for the manufacturer .....	6
5 Tasks for the certification body .....	10
6 Actions in the event of non-conformity .....	14
7 Procedure for third party certification of conformity .....	15
8 Certificates of conformity and conformity mark .....	15
9 Requirements for dispatching centres .....	15
<b>Annex A (normative) Evaluation of the representativeness and the accuracy of the 28 day activity index test results .....</b>	<b>20</b>
A.1 General .....	20
A.2 Sets of results considered .....	20
A.3 Evaluation procedure .....	20
A.3.1 Introduction .....	20
A.3.2 Symbols .....	20
A.3.3 Evaluation of whether set A and set B belong to the same population (sampling error check) .....	21
A.3.4 Comparison between set B and set C in order to check the accuracy of the autocontrol testing (testing error check) .....	21
<b>Annex B (informative) General definitions .....</b>	<b>22</b>
B.1 Definitions based on the Construction Products Directive .....	22
B.2 Definitions from or based on EN 45020 .....	22
B.3 Definition from EN ISO 8402 .....	22
B.4 Definitions from prEN 15167-1 and EN 196-7 .....	23
Bibliography .....	24

## Foreword

This document (prEN 15167-2:2005) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

The preparatory work was carried out by WG15 of CEN/TC 104 since November 2003 in which the following countries participated: Austria, Belgium, Czech Republic, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Poland, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

It is supported by standards in the EN 196 series on methods for testing cement. No existing European Standard is superseded.

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## 1 Scope

This standard specifies the scheme for the evaluation of conformity of ground granulated blastfurnace slag according to prEN 15167-1.

The standard provides technical rules for the production control by the manufacturer, including autocontrol testing of samples. It also provides rules for actions to be followed in the event of non-conformity, the procedure for the certification of conformity and requirements for dispatching centres.

## 2 Normative references

The following referenced documents are indispensable for the application 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 — Methods of taking and preparing samples of cement*

EN 15167-1:2005, *Ground granulated blastfurnace slag for concrete — Part 1: Definition, specifications and conformity criteria*

ISO 2854:1976, *Statistical interpretation of data — Techniques of estimation and tests relating to means and variances.*

## 3 Terms and definitions

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

### 1.1 Specific definitions

#### 3.1.1

##### **certificate of conformity**

document issued under the rules of a certain scheme for the evaluation of conformity indicating that adequate confidence is provided that ground granulated blastfurnace slag is in conformity with EN 15167-1

#### 3.1.2

##### **certification body**

impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out conformity certification according to given rules of procedure and management

#### 3.1.3

##### **certified ground granulated blastfurnace slag**

ground granulated blastfurnace slag for which a certificate of conformity has been issued

NOTE A single factory can manufacture more than one certified ground granulated blastfurnace slag, where each is subject to separate autocontrol and declaration of conformity.

#### 3.1.4

##### **confirmation autocontrol testing**

continual testing carried out by an intermediary which consists of testing of samples taken by the intermediary at the point(s) of release from the dispatching centre

**3.1.5**

**conformity mark**

protected mark applied on the basis of the certificate of conformity (see 3.1.1)

**3.1.6**

**depot**

bulk ground granulated blastfurnace slag handling facility (not located at the factory) used for the dispatch of ground granulated blastfurnace slag (whether in bulk or bagged) after transfer or storage where the manufacturer has full responsibility for all aspects of the quality of the ground granulated blastfurnace slag

**3.1.7**

**dispatching centre**

bulk ground granulated blastfurnace slag handling facility (not located at the factory) used for the dispatch of ground granulated blastfurnace slag after transfer or storage where an intermediary has full responsibility for all aspects of the quality of the ground granulated blastfurnace slag

**3.1.8**

**existing factory**

factory which is already producing ground granulated blastfurnace slag certified under this scheme

**3.1.9**

**factory production control**

permanent internal control of ground granulated blastfurnace slag production exercised by the manufacturer consisting of internal quality control and autocontrol testing

**3.1.10**

**factory**

facility used by a manufacturer for the production of ground granulated blastfurnace slag using equipment which is suitable for continuous mass production of ground granulated blastfurnace slag, in particular equipment for adequate grinding and homogenisation and the necessary silo capacity for the storage and dispatch of each ground granulated blastfurnace slag produced. This equipment and the production control applied allow the control of production with sufficient accuracy to ensure that the requirements of prEN 15167-1 are met.

**3.1.11**

**initial period**

immediate period after the first issuing of the certificate of conformity for a ground granulated blastfurnace slag

**3.1.12**

**intermediary**

natural or legal person who takes from the manufacturer ground granulated blastfurnace slag certified according to prEN 15167-2 and bearing the conformity mark, who undertakes full responsibility for maintaining in a dispatching centre all aspects of the quality of the ground granulated blastfurnace slag and who supplies the ground granulated blastfurnace slag onwards to a further natural or legal person

**3.1.13**

**new factory**

factory which is not already producing ground granulated blastfurnace slag certified under this scheme

**3.1.14**

**manufacturer**

operator of the factory

### 3.1.15

#### **works' quality manual**

document providing information on the production control that a manufacturer applies at a particular factory to ensure conformity of the ground granulated blastfurnace slag with the requirements of prEN 15167-1

## **1.2 General definitions**

See annex B (informative).

# **4 Tasks for the manufacturer**

## **4.1 Factory production control**

### **4.1.1 Concept**

Production control means the permanent internal control of ground granulated blastfurnace slag production exercised by the manufacturer and consists of internal quality control (see 4.2) and autocontrol testing<sup>1)</sup> of samples of ground granulated blastfurnace slag taken at the point of release (see 4.3).

NOTE The requirements of prEN 15167-2 as regards the production control take account of those clauses of EN ISO 9001 which are relevant to the production, process control and testing of ground granulated blastfurnace slag.

### **4.1.2 Works' quality manual**

The manufacturer's documentation and procedures for the production control shall be described in a Works' quality manual, which shall adequately describe, among other things:

- a) the quality aims and the organisational structure, responsibilities and powers of the responsible staff 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);
- b) the production 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 production, and the frequency with which they will be carried out (see 4.2.2, 4.3.1 and 4.3.3).

The Works' quality manual prepared by the manufacturer for each factory shall include an adequate system of documentation (see 4.1.4 and 4.3.4).

The Works' quality manual shall address and document the procedures operated to ensure that the ground granulated blastfurnace slag conforms to the technical specifications. The manual 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 manual shall be considered to include these associated documents.

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1) This testing corresponds also to the "further testing of samples" mentioned in Annex III Section 2 point (i) of the Construction Products Directive 89/106/EEC.



NOTE In the case of an existing quality management system according to EN ISO 9001, the certification body may examine if the corresponding quality manual meets all the requirements of prEN 15167-1 which are relevant to the production control of ground granulated blastfurnace slag. Provided all the requirements are included, this quality manual may also be applied for product certification.

### **4.1.3 Management systems**

#### **4.1.3.1 Quality policy statement**

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

#### **4.1.3.2 Management representative**

The manufacturer shall appoint a management representative who, irrespective of other responsibilities, shall have defined authority and responsibility for ensuring that the requirements of this standard for the evaluation of conformity are implemented and maintained.

#### **4.1.3.3 Internal audits and management review**

In order to ensure the continuing suitability and effectiveness of the Work's quality manual to meet the requirements of prEN 15167-1, the manufacturer shall perform at least once per year:

- a) internal audits covering the scope of clauses 4 and 6.1;
- b) a management review of the production control, taking into account records of the internal audits.

#### **4.1.3.4 Training**

The Works' quality manual shall describe the measures taken to ensure that all the personnel involved in operations that can affect internal quality control and product quality have appropriate experience or training. Appropriate records shall be retained.

### **4.1.4 System of documentation**

#### **4.1.4.1 Document control**

The management representative of the manufacturer shall be responsible for the control of all documents and data related to the production control and to this scheme for the evaluation of conformity.

This control shall ensure that the appropriate issues of all documents are available at essential locations, that obsolete documents are withdrawn and that changes or modifications to any document are effectively introduced.

A master list shall be established to identify the current version of documents in order to prevent the use of non-applicable documents.

#### **4.1.4.2 Quality records**

The manufacturer shall retain records of production control for at least the period required to comply with relevant legislation.

## 4.2 Internal quality control

### 4.2.1 Process control

#### 4.2.1.1 General

The Works' quality manual shall describe the parameters for process planning, process control and testing, inspection, corrective action, verification, dispatch and the associated records.

Where a factory uses more than one source of granulated blastfurnace slag, measures shall be provided for them to be separately and adequately stored, and for controlled proportioning and homogenisation.

Where a factory produces more than one certified ground granulated blastfurnace slag, measures shall be provided to store each product separately, enabling proper sampling, identification and despatch.

#### 4.2.1.2 Constituents and composition of ground granulated blastfurnace slag

The manufacturer shall establish documented procedures and appropriate test methods to ensure that the constituents meet the requirements of prEN 15167-1 and are suitable to enable ground granulated blastfurnace slag to be produced meeting the technical specification. The following shall be part of this documentation:

- c) the source of the granulated blastfurnace slags
- d) confirmation that the granulated blastfurnace slags and any grinding aids are in accord with clause 4 of prEN 15167-1

NOTE X-Ray Diffraction or optical-microscopy may be used to assess the content of glassy material in granulated blastfurnace slag.

#### 4.2.1.3 Control of off-specification production

The Works' quality manual shall contain procedures to ensure that off-specification production is adequately managed.

### 4.2.2 Measuring and testing

#### 4.2.2.1 Inspection, measuring and test equipment

The equipment for in-process inspection and testing shall be regularly checked and calibrated in accordance with the procedures and frequencies laid down in the Works' quality manual.

#### 4.2.2.2 Inspection and test status

Procedures for the inspection and test status through the stages of production shall be detailed in the Works' quality manual. These shall include procedures for the control of off-specification intermediate materials.

For the manufacturer's control of the grinding process, spot samples for the determination of fineness should be taken at an appropriate point that is between the grinding equipment and the storage silos.

#### 4.2.3 Handling, storage, packaging and delivery

The Works' quality manual shall describe the precautions taken for the protection of the quality of the ground granulated blastfurnace slag while under the responsibility of the manufacturer. It shall include a description of the procedures used at depots. Delivery documentation shall allow traceability to the producing factory.

### 4.3 Autocontrol testing of samples

#### 4.3.1 Sampling and testing

The manufacturer shall operate a system of autocontrol testing for each certified ground granulated blastfurnace slag. This system shall be used to demonstrate conformity to the requirements in clause 8 of prEN 15167-1. The properties to be tested, the testing methods, the minimum frequency of autocontrol testing during routine testing and initial period of testing and the conformity criteria shall be in accordance with the requirements given in clause 8 of prEN 15167-1. For ground granulated blastfurnace slags not being dispatched continuously, the frequency of testing and the point of sampling shall be as specified in the Works' quality manual.

All test data shall be documented.

#### 4.3.2 Corrective action

The Works' quality manual shall document procedures for the review and adjustment of the production control in case of non-conformity (see 6.1).

The actions taken in the event of non-conformity shall be recorded in a report subject to inspection during the management review.

In the event of ground granulated blastfurnace slag yielding a test result not conforming to the single result limit value conformity criteria specified in prEN 15167-1, the manufacturer shall immediately determine the affected quantity, take appropriate action to prevent the dispatch of this quantity and inform the affected customer if such ground granulated blastfurnace slag has been released. In addition, the manufacturer shall immediately determine the causes of such non-conformity, take corrective actions and undertake a review of all relevant production control procedures. All such actions and findings shall be appropriately recorded in a report subject to inspection during the management review.

NOTE The certification body may require to be kept informed of these actions and findings.

#### 4.3.3 Measuring and test equipment for autocontrol testing

The equipment used for autocontrol testing shall be regularly checked and calibrated in accordance with procedures and frequencies laid down in the Works' quality manual. These procedures may include comparison of strength test results by proficiency testing with another laboratory designated in the Works' quality manual.

The Works' quality manual shall document procedures to ensure that all personnel involved in autocontrol testing have appropriate experience and training. Appropriate records shall be retained.

#### 4.3.4 Quality records

The manufacturer shall retain records of the autocontrol test results and appropriate records on test equipment for at least the period required to comply with relevant legislation.