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Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

Deutsches Institut für Bautechnik
DIBt

Mitglied der EOTA
Member of EOTA

European Technical Approval ETA-07/0157

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Handelsbezeichnung *Trade name*	Hochofenzement CEM III/A 52,5 N-SR "Dortmund" *Blast furnace cement CEM III/A 52,5 N-SR "Dortmund"*
Zulassungsinhaber *Holder of approval*	CEMEX HüttenZement GmbH Im Karrenberg 36 44329 Dortmund DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck *Generic type and use of construction product*	Sonderzement CEM III/A mit hohem Sulfatwiderstand *Special cement CEM III/A with high sulfate resistance*
Geltungsdauer: vom *Validity: from* bis *to*	17 June 2013 17 June 2018
Herstellwerk *Manufacturing plant*	CEMEX HüttenZement GmbH Im Karrenberg 36 44329 Dortmund DEUTSCHLAND

Diese Zulassung umfasst *This Approval contains*	7 Seiten *7 pages*
Diese Zulassung ersetzt *This Approval replaces*	ETA-07/0157 mit Geltungsdauer vom 30.05.2012 bis 30.05.2017 *ETA-07/0157 with validity from 30.05.2012 to 30.05.2017*

I LEGAL BASES AND GENERAL CONDITIONS

1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];
- *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998[4], as amended by Article 2 of the law of 8 November 2011[5];*
- Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC[6].

2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.

3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.

4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.

6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1 Official Journal of the European Communities L 40, 11 February 1989, p. 12
2 Official Journal of the European Communities L 220, 30 August 1993, p. 1
3 Official Journal of the European Union L 284, 31 October 2003, p. 25
4 *Bundesgesetzblatt Teil I 1998*, p. 812
5 *Bundesgesetzblatt Teil I 2011*, p. 2178
6 Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product/ products and intended use

1.1 Definition of the construction product

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is a cement which fulfils all requirements given in EN 197-1[7] for a common cement of strength class 52,5 N.

Furthermore the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" has a high resistance against sulfate attack on concrete.

1.2 Intended use of the construction product

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is intended to be used for preparation of concrete, mortar, grouts and other mixes for construction and for the manufacturing of construction products.

Especially the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is characterized by an evidently high resistance against sulfate attack on concrete.

The provisions made in this European technical approval are based on an assumed working life of concrete, mortar, grouts and other mixes for construction similar to one of concrete, mortar and grouts incorporating common cement provided that the conditions laid down in sections 4.2 and 5.1 for packaging / transport / storage / applications are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of product and method of verification

2.1 Specifications for common cement

All specifications for a blast furnace cement CEM III/A of strength class 52,5 N shall be determined in accordance with EN 197-1[7].

All requirements given in EN 197-1[7] for a blast furnace cement CEM III/A of strength class 52,5 N shall be fulfilled.

2.2 Content of granulated blast furnace slag

The blast furnace slag content of the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" shall be determined by an appropriate verification method[8] and shall be at least 50 % by mass.

2.3 (CaO + MgO)/SiO_2–ratio of the granulated blast furnace slag

The chemical composition of the granulated blast furnace slag shall be determined in accordance with EN 196-2[9]. The (CaO + MgO)/SiO_2-ratio is calculated and shall exceed 1,3.

7 EN 197-1 Cement - Part 1: Composition, specification and conformity criteria for common cement

8 A appropriate verification method is the quantitative determination of the main constituents of cement, see also CEN/TR 196-4

9 EN 196-2 Methods of testing cement - chemical analysis of cement

2.4 Glass content of the granulated blast furnace slag

The glass content of the granulated blast furnace slag shall be determined by the test method given in CUAP 03.01/40, Annex A, and shall be at least 90 %.

2.5 Specific surface

The specific surface of the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" shall be determined by the air permeability method specified in EN 196-6[10] and shall be at least 520 m²/kg (limit value for single results: ≥ 490 m²/kg).

2.6 Minor additional constituents

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" does not contain minor additional constituents according to EN 197-1[7].

2.7 Sulfate resistance

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" shows a comparable sulfate resistance like a blast furnace cement CEM III/B-SR according to EN 197-1[7].

The sulfate resistance was determined with the flat prism method.

The test specimens were made of mortar according to EN 196-1[11] with blast furnace cement CEM III/A 52,5 N-SR "Dortmund" and with two reference cements (CEM I 42,5 R-SR 3 and CEM III/B 42,5 N-LH/SR according to EN 197-1[7]) according to the flat prism method.

24 flat prisms of each mortar with the dimensions 10 mm x 40 mm x 160 mm (12 prisms with and 12 prisms without pins) were made in accordance with EN 196-1[11] and were compacted on the vibrating table.

The prisms were stored for 2 days in the mould at 20 °C and a relative air humidity of > 95 % r.H..

After demoulding the prisms were pre-stored on edge until an age of 14 days, standing on granting in a saturated $Ca(OH)_2$-solution at 20 °C.

At the age of 14 days, a series of 3 flat prisms with measuring pins and 3 flat prisms without measuring pins were stored on edge, standing on gratings in a 4,4 % Na_2SO_4-solution at 5 °C and 20 °C. One of each series of 3 flat prisms with measuring pins and 3 flat prisms without measuring pins were stored on edge, standing on gratings (reference storage 5 °C) in a saturated $Ca(OH)_2$ solution at 5 °C. The other two series of each 3 flat prisms remained in storage of saturated $Ca(OH)_2$ solution at 20 °C (reference storage 20 °C).

The length and the dynamic modulus of elasticity of the flat prisms stored in 4,4 % Na_2SO_4-solution and in saturated $Ca(OH)_2$ solution were measured after 0, 14, 28, 56, 90 and 180 days.

The elongation of the flat prisms was calculated as mean value from 3 specimens. The difference in elongation between the sulfate storage and the reference storage was calculated as expansion of length.

Additionally the test specimens were visually examined after each test date.

After a testing period of 180 days the specimens show no expansion damages, cracks or flaking based on formation of thaumasite.

[10] EN 196-6 Methods of testing cement - Determination of fineness
[11] EN 196-1 Methods of testing cement - Part 1: Determination of strength

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" fulfils the following requirements for the sulfate testing:

20 °C-Storage

- after 90 days: max. expansion difference 0,5 mm/m
- after 180 days: max. expansion difference 0,8 mm/m
- Visual examination of the specimens after 180 days, stored in 4,4 % Na_2SO_4-solution:
  The specimens show no cracks or flaking.

5 °C-Storage

- after 90 days: max. expansion difference 0,5 mm/m
- Visual examination of the specimens after 180 days, stored in 4,4 % Na_2SO_4-solution:
  The specimens show no cracks or flaking.

3 Evaluation and attestation of conformity and CE-marking

3.1 System of attestation of conformity

According to the communication of the European Commission[12] the system 1+ of attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1+: Certification of the conformity of the product by an approved certification body on the basis of:

(a) Tasks for the manufacturer:
  (1) factory production control;
  (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) Tasks for the approved body:
  (3) initial type-testing of the product;
  (4) initial inspection of factory and of factory production control;
  (5) continuous surveillance, assessment and approval of factory production control;
  (6) audit-testing of samples taken at the factory.

Note: Approved bodies are also referred to as "notified bodies".

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use initial materials stated in the technical documentation of this European technical approval.

[12] Letter of the European Commission of 14.02.2006 to EOTA

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at Deutsches Institut für Bautechnik[13].

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

3.2.1.2 Other tasks of manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of special cement CEM III/A with high sulfate resistance in order to undertake the actions laid down in section 3.3. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

3.2.2 Tasks of approved bodies

The approved body shall perform the

- initial type-testing of the product,
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control,
- audit-testing of samples taken at the factory

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

3.3 CE marking

The CE marking shall be affixed on the packages and the accompanying commercial documents respectively. The letters "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European technical approval,
- the designation of the product indicating the cement product, the strength class and the notation "SR" for high sulfate resistance,
- if so the limit of chloride, in %[14].

[13] The control plan is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

[14] Only where the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is produced to meet a chloride content limit different to the value specified in Table 3 of EN 197-1[7].

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is manufactured from a Portland cement clinker and granulated blast furnace slag with the addition of gypsum or anhydrite or any mixture of them to control setting. Grinding is carried out combined or separately with subsequent mixing. The sources of the constituents are deposited at Deutsches Institut für Bautechnik.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Application

The blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is intended to be used for preparation of concrete, mortar; grouts and other mixes for construction and for the manufacturing of construction products.

Especially the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" is characterized by an evidently high resistance against sulfate attack on concrete.

5 Indications to the manufacturer

5.1 Packaging, transport and storage

In the production plant the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" shall be stored in silos.

Packaging, transport, storage of the blast furnace cement CEM III/A 52,5 N-SR "Dortmund" shall be the same as for common cements according to EN 197-1[7].

The manufacturer shall ensure that the requirements given in sections 1, 2 and 4 are made known to those involved. This can be implemented by, for example, handing over copies of the appropriate sections of the European technical approval.

Andreas Kummerow
p. p. Head of Department

beglaubigt:
Schröder