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BSI Standards Publication

Hydraulic road binders

Part 1: Rapid hardening hydraulic road binders — Composition, specifications and conformity criteria

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National foreword

This British Standard is the UK implementation of EN 13282-1:2013. Together with BS EN 13282-2:2015, it supersedes DD ENV 13282:2000 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee B/516, Cement and lime, to Subcommittee B/516/14, Special hydraulic road binders.

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

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Hydraulic road binders - Part 1: Rapid hardening hydraulic road binders - Composition, specifications and conformity criteria

Liants hydrauliques routiers - Partie 1: Liants hydrauliques routiers à durcissement rapide - Composition, spécifications et critères de conformité

Hydraulische Tragschichtbinder - Teil 1: Schnell erhärtende hydraulische Tragschichtbinder - Zusammensetzung, Anforderungen und Konformitätskriterien

This European Standard was approved by CEN on 20 October 2012.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Hydraulic road binder	6
4.1 General	6
4.2 Rapid hardening hydraulic road binder	6
5 Constituents	6
5.1 Main constituents.....	6
5.2 Minor additional constituents.....	7
5.3 Calcium sulfate (Cs).....	7
5.4 Additives.....	7
6 Classification.....	7
7 Requirements	8
7.1 Mechanical requirements.....	8
7.2 Physical requirements	8
7.3 Chemical requirement - Sulfate content.....	9
7.4 Composition	9
7.5 Durability requirements	10
7.6 Dangerous substances	10
8 Standard designation.....	10
9 Conformity criteria	11
9.1 General requirements	11
9.2 Conformity criteria for mechanical, physical and chemical properties and evaluation procedure	12
9.3 Conformity criteria for composition of rapid hardening hydraulic road binders	16
9.4 Conformity criteria for properties of constituents of rapid hardening hydraulic road binders.....	16
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive	17
Bibliography.....	21

Foreword

This document (EN 13282-1:2013) 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 September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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 and EN 13282-2¹⁾ supersede ENV 13282:2000.

This document 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).

For relationship with EU directive(s), see informative Annex ZA, which is an integral part of this European Standard.

This European Standard, EN 13282, *Hydraulic road binders* consists of the following parts:

- *Part 1: Rapid hardening hydraulic road binders — Composition, specifications and conformity criteria*
- *Part 2: Normal hardening hydraulic road binders — Composition, specifications and conformity criteria*
- *Part 3: Conformity evaluation*

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1) To be published.

Introduction

Depending on the local experience and availability of products and materials, different binders are used for road bases and sub-bases, capping layers, soil treatment (soil stabilisation and improvement) in Europe. These include cements conforming to EN 197-1, building limes conforming to EN 459-1 and hydraulic road binders presently defined in existing national standards or national technical approvals.

Hydraulic road binders are finished products, produced in a factory and supplied ready for use. They are differentiated according to their strength development in rapid hardening hydraulic road binders, specified in this part of this European Standard and normal hardening hydraulic road binders, specified in prEN 13282-2. Part 3 of EN 13282 defines the conformity evaluation procedure for hydraulic road binders according to this standard.

Binders obtained through mixing of their constituents on site are not covered by this European Standard.

Cements, masonry cements and building limes are also outside the scope of this European Standard, as they are defined in specific European Standards.

1 Scope

This European Standard defines and gives the specifications for rapid hardening hydraulic road binders, produced in a factory and supplied ready for treatment of materials for bases, sub-bases and capping layers as well as earthworks, in road, railway, airport and other types of infrastructure.

It includes the mechanical, physical and chemical requirements and the classification of these binders based on their compressive strength at 7 days and 28 days. It also includes the conformity criteria and evaluation procedures to be applied by the manufacturer.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 196-1, *Methods of testing cement — Part 1: Determination of strength*

EN 196-2, *Methods of testing cement — Part 2: Chemical analysis of cement*

EN 196-3, *Methods of testing cement — Part 3: Determination of setting times and soundness*

EN 196-6, *Methods of testing cement — Part 6: Determination of fineness*

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 459-1, *Building lime — Part 1: Definitions, specifications and conformity criteria*

EN 459-2, *Building lime — Part 2: Test methods*

EN 13282-3:2013, *Hydraulic road binders — Part 3: Conformity evaluation*

ISO 10694, *Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

autocontrol testing

continual testing by the manufacturer of rapid hardening hydraulic road binder spot samples taken at the point(s) of release from the factory/depot

3.2

control period

period of production and dispatch identified for the evaluation of the autocontrol test results

3.3

characteristic value

value of a required mechanical, physical or chemical property outside of which lies a specified percentage, the percentile P_k , of all the values of the population

3.4 specified characteristic value
characteristic value of a mechanical, physical or chemical property which in the case of an upper limit is not to be exceeded or in the case of a lower limit is, as a minimum, to be reached

3.5 single result limit value
value of a mechanical, physical or chemical property which – for any single test result – in the case of an upper limit is not to be exceeded or in the case of a lower limit is, as a minimum, to be reached

3.6 allowable probability of acceptance CR
for a given sampling plan, the allowed probability of acceptance of a rapid hardening hydraulic road binder with a characteristic value outside the specified characteristic value

4 Hydraulic road binder

4.1 General

A hydraulic binder, when mixed with water, hardens both in the air and under water and remains solid, even under water.

A hydraulic road binder is a factory produced hydraulic binder, supplied ready for use, having properties specifically suitable for treatment of materials for bases, sub-bases and capping layers as well as earthworks, in road, railway, airport and other types of infrastructures.

NOTE 1 Hydraulic road binders are not only used for road construction but this general designation will be used for a better understanding in this document.

A hydraulic road binder consists of a powder made from a blend of different constituents and statistically homogeneous in composition. A high degree of uniformity in all properties shall be obtained through continuous mass production processes.

NOTE 2 Continuous production refers to the process, the definition of the product, its composition and properties but does not imply a 24 h production.

4.2 Rapid hardening hydraulic road binder

A rapid hardening hydraulic road binder is a hydraulic road binder which conforms to the requirements for strength at 7 days and 28 days, fineness, initial setting time, soundness, sulfate content and composition, as given in Clause 7.

5 Constituents

5.1 Main constituents

The main constituents of a rapid hardening hydraulic road binder are those in a proportion exceeding 10 % by mass. They shall be selected from the following list:

- a) constituents defined as main constituents in EN 197-1:
 - 1) Portland cement clinker (K);
 - 2) granulated blastfurnace slag (S);
 - 3) pozzolanic materials: natural pozzolana (P) and natural calcined pozzolana (Q);
 - 4) fly ash: siliceous fly ash (V) and calcareous fly ash (W);

- 5) burnt shale (T);
- 6) limestone (L, LL);

b) hydrated calcium lime (CL-S) and natural hydraulic lime (NHL) which conform to EN 459-1.

The loss on ignition of fly ash, determined in accordance with EN 196-2, but using an ignition time of 1 h, or the content of unburnt carbon, determined in accordance with ISO 10694, shall not exceed 9,0 % by mass.

5.2 Minor additional constituents

Minor additional constituents may be added in a proportion not exceeding 10 % by mass in total.

Minor additional constituents are specially selected, inorganic natural mineral materials, inorganic mineral materials derived from the clinker or calcium lime production process, or constituents as specified in 5.1 unless they are included as main constituents which, after appropriate preparation and on account of their particle size distribution, improve the physical properties of the binder (such as workability or water retention). They can be inert or have slightly hydraulic, latent hydraulic or pozzolanic properties. However, no requirements are set for them in this respect.

Minor additional constituents shall be correctly prepared, i.e. selected, homogenised, dried and comminuted depending on their state of production or delivery.

Minor additional constituents shall not impair the properties of the binder.

5.3 Calcium sulfate (Cs)

Calcium sulfate, gypsum, hemihydrate or anhydrite (natural or artificial) or any mixture of them may be added to the other constituents of the rapid hardening hydraulic road binder during its manufacture.

5.4 Additives

Additives, for the purpose of this European Standard, are constituents not covered in 5.1 to 5.3 which are added to improve the manufacture or the properties of the rapid hardening hydraulic road binder.

The total quantity of additives on dry basis should not exceed 1 % by mass of the binder.

A total content of additives greater than 1 % by mass is permitted provided that quantity and function of each of them are stated on the packaging and/or on the delivery note.

Additives shall not impair the properties of the rapid hardening hydraulic road binder.

6 Classification

Rapid hardening hydraulic road binders are designated by the letter E followed by a number, representing the strength class.

The strength class of a rapid hardening hydraulic road binder shall be determined by the compressive strength at 7 days and 28 days tested in accordance with EN 196-1.

Three strength classes are defined in Table 1: E 2, E 3 and E 4 (see 7.1). For class E 4, a sub-class indicated as E 4-RS and representing rapid setting rapid hardening hydraulic road binders is defined.

NOTE 1 An E 1 class is not included in this European Standard in order to be consistent with the strength classes defined in prEN 13282-2.

NOTE 2 Strength classes are incorporated for the purpose of classifying product performance and carrying out attestation of conformity and are not related to the mechanical performance of soils or other materials treated with rapid hardening hydraulic road binders.

7 Requirements

7.1 Mechanical requirements

The compressive strength of rapid hardening hydraulic road binders shall be determined in accordance with EN 196-1, the cement being replaced by the rapid hardening hydraulic road binder.

The prisms shall be produced, stored and tested as specified in EN 196-1, unless otherwise specified below.

The prisms shall be removed from the mould 24 h after preparation and then stored, pending the test, at a relative humidity of not less than 90 %.

Should it not be possible to remove the prisms from the mould at 24 h, it is permitted to remove them at a later age, and this age shall be stated in the test report.

When using moist air storage boxes the prisms shall not be allowed to come into contact with the water poured into the boxes up to a level of about 10 mm. The lid shall close tightly and any felt seals shall be kept damp.

Rapid hardening hydraulic road binders shall conform to the requirements given in Table 1.

Table 1 — Mechanical requirements given as characteristic values

Strength class	Compressive strength, in MPa		
	at 7 days	at 28 days	
E 2	≥ 5,0	≥ 12,5	≤ 32,5
E 3	≥ 10,0	≥ 22,5	≤ 42,5
E 4	≥ 16,0	≥ 32,5	≤ 52,5
E 4-RS	≥ 16,0	≥ 32,5	-

7.2 Physical requirements

7.2.1 Fineness

The fineness of a rapid hardening hydraulic road binder shall be determined by sieving.

Sieving shall be carried out in accordance with EN 196-6. The sieve residue shall conform to the requirement given in Table 2.

7.2.2 Initial setting time

Initial setting time, determined in accordance with EN 196-3, shall conform to the requirement given in Table 2.

7.2.3 Soundness

Expansion, determined in accordance with EN 196-3, shall conform to the requirement given in Table 2.

Rapid hardening hydraulic road binders containing more than 4,0 % by mass of SO₃ shall, in addition, withstand the cold water test described in EN 459-2. They shall be regarded as unsound if, following storage in water, the two specimens have warping or gaping edge cracks either on their own or in conjunction with crazing.

Table 2 — Physical requirements given as characteristic values

Hydraulic road binder	Fineness residue by mass at 90 µm %	Initial setting time min	Soundness (expansion) mm
E 2 E 3 E 4	≤ 15	≥ 90	≤ 10
E 4-RS	≤ 15	≤ 90	≤ 10

7.3 Chemical requirement - Sulfate content

The sulfate content, expressed as the percentage of SO₃ by mass, and determined in accordance with EN 196-2, shall not exceed 4,0 %.

A sulfate content of up to 7,0 % by mass (classes E 4 and E 4-RS) and 9,0 % by mass (classes E 2 and E 3), respectively, is permitted for the following rapid hardening road binders, provided that they meet the requirements in 7.2.3:

- rapid hardening hydraulic road binders containing burnt shale (T) or calcareous fly ash (W), only when most of the sulfate comes from the main constituents;
- rapid hardening hydraulic road binders containing more than 65 %, by mass, of granulated blastfurnace slag (S).

A sulfate content of up to 9,0 % by mass (classes E 4 and E 4-RS) and 11,5 % (classes E 2 and E 3), respectively, is permitted for binders containing burnt shale or calcareous fly ash, only when the greater part of the sulfate content comes from the burnt shale or from the calcareous fly ash.

7.4 Composition

7.4.1 Declaration of composition

The constituents of a rapid hardening hydraulic road binder, and their average proportion in the finished product, shall be recorded. When requested, the main constituents (5.1) shall be declared by the manufacturer (see Clause 8), as well as the presence of calcium sulfate (5.3) if the sulfate (SO₃) content of the rapid hardening hydraulic road binder exceeds 4,0 %.

7.4.2 Requirements on composition

The content of Portland cement clinker of rapid hardening hydraulic road binders shall be not less than 20 %.

The composition of a rapid hardening hydraulic road binder shall meet, for all main constituents taken individually, the values documented by the manufacturer and declared if requested (see 7.4.1 and Clause 8) within absolute tolerances given in Table 3.

When SO₃ content exceeds 4,0 %, the notation Cs shall be added in the declaration (see 7.4.1).

Table 3 — Declared composition and tolerances

Proportion of a main constituent ^a declared	Absolute tolerance ^a %
> 20	± 10
> 10 ≤ 20	± 5
^a Values in percentage by mass related to the total mass of the main and minor additional constituents excluding calcium sulfate and additives.	

EXAMPLE: For a declared composition of S 55, K 35, V 10, the actual composition of the rapid hardening hydraulic road binder would be within the following limits (related to the total mass of HRB with the exclusion of calcium sulfate (Cs) and additives):

- S : 45 % to 65 %,
- K : 25 % to 45 %,
- V : 5 % to 15 %.

7.5 Durability requirements

In many applications, particularly in severe environmental conditions, the choice of binder has an influence on the durability of the finished works, e.g. soundness, frost resistance or chemical resistance.

The choice of binder, particularly with regard to type and strength class for different applications and exposure classes, shall follow the appropriate standards and/or regulations valid in the place of use.

7.6 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonised test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction web site on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>.

8 Standard designation

Rapid hardening hydraulic road binders shall be identified on accompanying documents and, where relevant, on the packaging, by:

- the letters HRB;
- the strength class;
- the composition (when requested).

When the constituents of the rapid hardening hydraulic road binder and their average proportion are to be declared (see 7.4.1), they shall be included in the designation using the symbol of each constituent (see 5.1 and 5.3).

Where limes are used as constituents, the part of their standard designation according to EN 459-1 referring to the type shall be included in the designation using the symbol of each constituent (CL-S or NHL).

Particular properties relevant to the intended use are not included in the standard designation; advice may be given on the delivery documents or packaging.

EXAMPLE 1 (compulsory information): A rapid hardening hydraulic road binder conforming to this European Standard, of strength class E 4 and containing at least 20 % Portland cement clinker, is identified by:

- Rapid hardening hydraulic road binder EN 13282-1;
- HRB E 4.

EXAMPLE 2 (when declaration is requested): A rapid hardening hydraulic road binder conforming to this European Standard, of strength class E 3 and declared to consist of 20 % clinker, 35 % granulated blast furnace slag, 30 % siliceous fly ash and 15 % hydrated calcium lime, is identified by:

- Rapid hardening hydraulic road binder EN 13282-1;
- HRB E 3 K20, S35, V30, CL-S15.

EXAMPLE 3 (when declaration is requested): A rapid hardening hydraulic road binder conforming to this European Standard, of strength class E 4 and declared to consist of 46 % granulated blastfurnace slag, 35 % clinker, 10 % siliceous fly ash and 9 % minor additional constituents, is identified by:

- Rapid hardening hydraulic road binder EN 13282-1;
- HRB E 4 S46, K35, V10.

9 Conformity criteria

9.1 General requirements

The manufacturing process and its control shall ensure that the composition of a rapid hardening hydraulic road binder is kept within the limits specified in this European Standard.

Conformity of rapid hardening hydraulic road binders to this European Standard shall be continually evaluated on the basis of testing of spot samples.

The properties, test methods and the minimum testing frequencies for the autocontrol testing by the manufacturer are specified in Table 4.

Concerning testing frequencies for rapid hardening hydraulic road binders not being dispatched continuously and other details, see EN 13282-3.

NOTE 1 For certification of conformity by an approved certification body, conformity of rapid hardening hydraulic road binders with this European Standard is evaluated in accordance with Annex ZA and the relevant cited clauses of EN 13282-3.

NOTE 2 This European Standard does not deal with acceptance inspection at delivery.

Table 4 — Properties, test methods and minimum testing frequencies for the autocontrol testing by the manufacturer, and the statistical assessment procedure

Property (reference)		Test method ^{a b}	Minimum testing frequency	Statistical assessment by	
				Variables ^c	Attributes ^d
Strength (7.1)		EN 196-1 and see 7.1	1 per week	x	
Initial setting time (7.2.2)		EN 196-3	1 per week		x
Fineness (7.2.1)		EN 196-6	1 per week		x
Soundness (7.2.3)	SO ₃ ≤ 4,0 %	EN 196-3	1 per week		x
	SO ₃ > 4,0 %	EN 196-3 and EN 459-2			
Sulfate content (7.3)		EN 196-2	1 per week		x
Composition (7.4)		- ^e	1 per month		x

^a Where allowed in the relevant part of EN 196, other methods than those indicated may be used provided they give results correlated and equivalent to those obtained with the reference method.

^b The methods used to take and prepare samples shall be in accordance with EN 196-7.

^c If the data are not normally distributed, then the method of assessment may be decided on a case by case basis.

^d If the number of samples is at least two per week the assessment may be made by variables.

^e Appropriate test method chosen by the manufacturer.

9.2 Conformity criteria for mechanical, physical and chemical properties and evaluation procedure

9.2.1 General

Conformity of rapid hardening hydraulic road binders to the requirements for mechanical, physical and chemical properties in this European Standard is assumed if the conformity criteria specified in 9.2.2 and 9.2.3 are met. Conformity shall be evaluated on the basis of continual sampling using spot samples taken at the point of release and on the basis of the test results obtained on all autocontrol samples taken during the control period.

9.2.2 Statistical conformity criteria

9.2.2.1 General

Conformity shall be formulated in terms of a statistical criterion based on:

- the specified characteristic values for mechanical, physical and chemical properties as given in 7.1, 7.2, and 7.3 of this European Standard;
- the percentile P_k on which the specified characteristic value is based, as specified in Table 5;
- the allowable probability of acceptance CR , as given in Table 5.

Table 5 — Required values P_k and CR

	Mechanical requirements		Physical requirements and SO ₃ content
	7 day and 28 day strength (lower limit)	28 day strength (upper limit)	
Percentile P_k on which the characteristic value is based	5 %	10 %	
Allowable probability of acceptance CR	5 %		

NOTE Conformity evaluation by a procedure based on a finite number of test results can only produce an approximate value for the proportion of results outside the specified characteristic value in a population. The larger the sample size (number of test results), the better the approximation. The selected probability of acceptance CR controls the degree of approximation by the sampling plan.

Conformity with the requirements of this European Standard shall be verified either by variables or by attributes, as described in 9.2.2.2 and 9.2.2.3 respectively, as specified in Table 4.

The control period shall be 12 months.

9.2.2.2 Inspection by variables

For this inspection the test results are assumed to be normally distributed.

Conformity is verified when Formulae (1) and (2), as relevant, are satisfied:

$$\bar{x} - k_A \cdot s \geq L \quad (1)$$

and

$$\bar{x} + k_A \cdot s \leq U \quad (2)$$

where

- \bar{x} is the arithmetic mean of the totality of the autocontrol test results in the control period;
- s is the standard deviation of the totality of the autocontrol test results in the control period;
- k_A is the acceptability constant;
- L is the specified lower limit given in Tables 1 and 2 referred to in 7.1 and 7.2;
- U is the specified upper limit given in Tables 1 and 2 referred to in 7.1 and 7.2.

The acceptability constant k_A depends on the percentile P_k on which the characteristic value is based, on the allowable probability of acceptance CR and on the number n of test results. Values of k_A are listed in Table 6.

Table 6 — Acceptability constant k_A

Number of test results n	k_A^a	
	For $P_k = 5\%$	For $P_k = 10\%$
	(strength at 7 days and 28 days, lower limit)	(other properties)
20 to 21	2,40	1,93
22 to 23	2,35	1,89
24 to 25	2,31	1,85
26 to 27	2,27	1,82
28 to 29	2,24	1,80
30 to 34	2,22	1,78
35 to 39	2,17	1,73
40 to 44	2,13	1,70
45 to 49	2,09	1,67
50 to 59	2,07	1,65
60 to 69	2,02	1,61
70 to 79	1,99	1,58
80 to 89	1,97	1,56
90 to 99	1,94	1,54
100 to 149	1,93	1,53
150 to 199	1,87	1,48
200 to 299	1,84	1,45
300 to 399	1,80	1,42
≥ 400	1,78	1,40

NOTE Values given in this table are valid for $CR = 5\%$.

^a Values of k_A valid for intermediate values of n may also be used.

9.2.2.3 Inspection by attributes

The number c_D of test results outside the characteristic value shall be counted and compared with an acceptable number c_A , calculated from the number n of autocontrol test results and the percentile P_k , as specified in Table 7.

Conformity is verified when Formula (3) is satisfied:

$$c_D \leq c_A \tag{3}$$

The value of c_A depends on the percentile P_k on which the characteristic value is based, on the allowable probability of acceptance CR and on a number n of the test results. Values of c_A are listed in Table 7.

Table 7 — Values of c_A

Number of test results n^a	c_A for $P_K = 10\%$
20 to 39	0
40 to 54	1
55 to 69	2
70 to 84	3
85 to 99	4
100 to 109	5
110 to 123	6
124 to 136	7

NOTE Values given in this table are valid for $CR = 5\%$.

^a If the number of test results is $n < 20$ (for $P_K = 10\%$), a statistically based conformity criterion is not possible. Despite this, a criterion of $c_A = 0$ shall be used in cases where $n < 20$.

9.2.3 Single result conformity criteria

In addition to the statistical conformity criteria, conformity of test results to the requirements of this European Standard requires that it shall be verified that each test result remains within the single result limit values specified in Table 8.

Table 8 — Limit values for single results

Property		Limit values		
		Strength class		
		E 2	E 3	E 4 E 4-RS
Strength lower limit (MPa)	7 days	3,0	8,0	14,0
	28 days	10,0	20,0	30,0
Sulfate content upper limit (% SO ₃ by mass)		5,0 ^a		
Fineness upper limit (% residue)	90 μm	17,0		
Initial setting time lower limit (min)		75 (E-RS: 105 upper limit)		
Soundness upper limit (mm)		11		
Clinker content lower limit (%)		18,0		

^a For rapid hardening hydraulic road binders containing burnt shale, calcareous fly ash or more than 65 % of granulated blast furnace slag (see 7.3), limit values of 8,0 % (classes E 4 and E 4-RS) and 10,0 % (classes E 2 and E 3) by mass of SO₃ are respectively allowed. Limit values of 10,0 % (classes E 4 and E 4-RS) and 12,0 % (classes E 2 and E 3) by mass of SO₃ are respectively allowed for rapid hardening hydraulic road binders containing burnt shale or calcareous fly ash (see 7.3).

9.3 Conformity criteria for composition of rapid hardening hydraulic road binders

At least once per month the composition of the rapid hardening hydraulic road binder shall be checked by the manufacturer, using as a rule a spot sample taken at the point of release of the rapid hardening hydraulic road binder. The rapid hardening hydraulic road binder composition shall meet the requirements specified (see 7.4). The limiting quantities of the main constituents specified in Table 3 are reference values to be met by the average composition calculated from the spot samples taken in the control period. For single results, maximum deviations of -2 at the lower and $+2$ at the higher reference value are allowed. Suitable procedures during production and appropriate verification methods to ensure conformity to this requirement shall be applied and documented.

9.4 Conformity criteria for properties of constituents of rapid hardening hydraulic road binders

The constituents of a rapid hardening hydraulic road binder shall meet the requirements specified in Clause 5. Suitable procedures during production to ensure conformity with this requirement shall be applied and documented.

Annex ZA (informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/114 CEMENT, BUILDING LIMES AND OTHER HYDRAULIC BINDERS given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the rapid hardening hydraulic road binders covered by this annex for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

This annex establishes the conditions for the CE marking of a rapid hardening hydraulic road binder intended for the use indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as Clause 1 of this standard and this scope is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for rapid hydraulic road binders

Construction Product: Rapid hardening hydraulic road binder as covered under the scope of this standard			
Intended use: Treatment of materials for bases, sub-bases, capping layers and earthworks in roads, railways, airports and other types of infrastructures			
Essential characteristics	Requirement clauses in this and other European Standard(s)	Levels and/or classes	Notes
Compressive strength (at 7 days and 28 days)	7.1	-	Declared class
Setting time	7.2.2	-	Lower or upper limit in min
Fineness	7.2.1	-	Upper limit in %
Soundness - maximum expansion	7.2.3	-	Upper limit in mm
Sulfate content	7.3	-	Upper limit in %
Durability	7.5	-	-
Dangerous substances	7.6	-	-

The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.

ZA.2 Procedure for attestation of conformity of rapid hardening hydraulic road binders

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of the rapid hardening hydraulic road binders indicated in Table ZA.1, in accordance with the Decision of the Commission 97/555/EC of 14 July 1997 as amended by Commission Decision 2010/683EU of 9 November 2010 (OJEU L 293 page 60 dated 11.11.2010) and as given in Annex III of the mandate for "CEMENT, BUILDING LIMES AND OTHER HYDRAULIC BINDERS ", is shown in Table ZA.2 for the indicated intended use and relevant level(s) or class (es).

Table ZA.2 — System of attestation of conformity

Product	Intended use	Level(s) class(es)	or	Attestation of conformity system
Rapid hardening hydraulic road binders	Treatment of materials for bases, sub-bases, capping layers and earthworks in roads, railways, airports and other types of infrastructures			2+
System 2+: See Directive 89/106/EEC (CPD) Annex III.2.(ii), First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control.				

The attestation of conformity of the rapid hardening hydraulic road binders in Table ZA.1 shall be according to the evaluation of conformity procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standards indicated therein.

Table ZA.3 — Assignment of evaluation of conformity tasks for rapid hardening hydraulic road binders under system 2+

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (FPC)	Parameters related to all characteristics of Table ZA.1 relevant for the intended use	EN 13282-1:2013, Clause 9 and EN 13282-3:2013, Clause 4
	Initial type testing by the manufacturer	Parameters related to all characteristics of Table ZA.1 relevant for the intended use	EN 13282-1:2013, Clause 9 and EN 13282-3:2013, Clause 5
	Testing of samples taken at the factory	All characteristics of Table ZA.1 relevant for the intended use	EN 13282-1:2013, Clause 9 and EN 13282-3:2013, Clause 5
Tasks under the responsibility of the certification body	Certification of FPC on the basis of	Initial inspection of factory and of FPC	EN 13282-1:2013, Clause 9 and EN 13282-3:2013, Clause 4 and 6.2
		Continuous surveillance, assessment and approval of FPC	Parameters related to all characteristics of Table ZA.1, relevant for the intended use: Compressive strength Initial setting time Fineness Soundness - maximum expansion Sulfate content

ZA.2.2 EC Certificate and Declaration of conformity

When compliance with the conditions of this annex is achieved, and once the notified body has drawn up the certificate mentioned below, the manufacturer or his agent established in the EEA shall draw up and retain a declaration of conformity, which entitles the manufacturer to affix the CE marking. This declaration shall include:

- name and address of the manufacturer, or his authorised representative established in the EEA, and the place of production;

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

- description of the product (type, identification, use, ...), and a copy of the information accompanying the CE marking;

NOTE 2 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

- provisions to which the product conforms (i.e. Annex ZA of this European Standard), and a reference to the ITT report(s) and factory production control records (if appropriate);
- particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);
- the number of the accompanying factory production control certificate, and FPC records, where applicable;
- name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

The declaration shall be accompanied by a factory production control certificate, drawn up by the notified body, which shall contain, in addition to the information above, the following:

- name and address of the notified body;
- the number of the factory production control certificate;
- conditions of validity of the certificate, where applicable;
- name of, and position held by, the person empowered to sign the certificate.

The above mentioned declaration and certificate shall be presented in the language or languages accepted in the Member State in which the product is to be used.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EEC and shall be shown on the label, the packaging or on the accompanying commercial documents e.g. a delivery note. The following information shall accompany the CE marking symbol:

- identification number of the certification body;
- name or identifying mark and registered address of the manufacturer (see Note 1 in ZA.2.2);
- the last two digits of the year in which the marking is affixed;

- number of the EC factory production control certificate;
- reference to this European Standard;
- description of the product: generic name, material, dimensions, ... and intended use;
- information on those relevant essential characteristics listed in Table ZA.1 which are to be declared presented as:
 - declared values and, where relevant, level or class (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic as indicated in "Notes" in Table ZA.1;
 - “No performance determined” for characteristics where this is relevant.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

Figure ZA.1 gives an example of the information to be given on the label, packaging and/or commercial documents.


 0123	<p><i>CE conformity marking, consisting of the “CE”-symbol given in Directive 93/68/EEC</i></p> <p><i>Identification number of the certification body</i></p>
AnyCo Ltd, PO Box 21, B-1050 13 0123-CPD-0023	<p><i>Name or identifying mark and registered address of the producer</i></p> <p><i>Last two digits of the year in which the marking was affixed</i></p> <p><i>Certificate number</i></p>
EN 13282-1 Rapid hardening hydraulic road binder HRB E 3 Additional information	<p><i>No. of European Standard</i></p> <p><i>Description of product</i></p> <p><i>Standard designation</i></p> <p><i>Sulfate content</i></p> <p><i>Durability</i></p> <p><i>Dangerous substances</i></p>

Figure ZA.1 — Example of CE marking information

Bibliography

- [1] EN 451-1, *Method of testing fly ash — Part 1: Determination of free calcium oxide content*
- [2] prEN 13282-2, *Hydraulic road binders — Part 2: Normal hardening hydraulic road binders — Composition, specifications and conformity criteria*

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