

Hydraulically bound mixtures — Specifications —

Part 5: Hydraulic road binder bound mixtures

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National foreword

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The UK participation in its preparation was entrusted by Technical Committee B/510, Road materials, to Subcommittee B/510/4, Cementitious bound materials, unbound granular materials, waste materials and marginal materials, which has the responsibility to:

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Foreword

This document (EN 14227-5:2004) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by DIN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

This document is one of a series of standards for hydraulically bound mixtures:

prEN 14227-1, *Unbound and hydraulically bound mixtures — Specifications — Part 1: Cement bound granular mixtures*

prEN 14227-2, *Hydraulically bound mixtures — Specifications — Part 2: Slag bound mixtures*

EN 14227-3, *Hydraulically bound mixtures — Specifications — Part 3: Fly ash bound mixtures*

EN 14227-4, *Hydraulically bound mixtures — Specifications — Part 4: Fly ash for hydraulically bound mixtures*

EN 14227-5, *Hydraulically bound mixtures — Specifications — Part 5: Hydraulic road binder bound mixtures*

prEN 14227-10, *Hydraulically bound mixtures — Specifications — Part 10: Soil treated by cement*

prEN 14227-11, *Hydraulically bound mixtures — Specifications — Part 11: Soil treated by lime*

prEN 14227-12, *Hydraulically bound mixtures — Specifications — Part 12: Soil treated by slag*

prEN 14227-13, *Hydraulically bound mixtures — Specifications — Part 13: Soil treated by hydraulic road binder*

prEN 14227-14, *Hydraulically bound mixtures — Specifications — Part 14: Soil treated by fly ash*

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1 Scope

This document specifies hydraulic road binder bound mixtures for roads, airfields and other trafficked areas and specifies the requirements for their constituents, composition and laboratory performance classification.

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 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

EN 1097-6:2000, *Tests for mechanical and physical properties of aggregates – Part 6: Determination of particle density and water absorption*

EN 1097-7, *Tests for mechanical and physical properties of aggregates – Part 7: Determination of the particle density of filler – Pycnometer method*

EN 13242, *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction*

ENV 13282, *Hydraulic road binders — Composition, specifications and conformity criteria*

EN 13286-1, *Unbound and hydraulically bound mixtures — Part 1: Test methods for laboratory reference density and water content – Introduction, general requirements and sampling*

EN 13286-2, *Unbound and hydraulically bound mixtures — Part 2: Test methods for the determination of the laboratory reference density and water content — Proctor compaction*

EN 13286-3, *Unbound and hydraulically bound mixtures — Part 3: Test methods for laboratory reference density and water content — Vibrocompression with controlled parameters*

EN 13286-4, *Unbound and hydraulically bound mixtures — Part 4: Test methods for laboratory reference density and water content — Vibrating hammer*

EN 13286-5, *Unbound and hydraulically bound mixtures — Part 5: Test methods for laboratory reference density and water content — Vibrating table*

EN 13286-40, *Unbound and hydraulically bound mixtures — Part 40: Test method for the determination of the direct tensile strength of hydraulically bound mixtures*

EN 13286-41, *Unbound and hydraulically bound mixtures — Part 41: Test method for the determination of the compressive strength of hydraulically bound mixtures*

EN 13286-42, *Unbound and hydraulically bound mixtures — Part 42: Test method for the determination of the indirect tensile strength of hydraulically bound mixtures*

EN 13286-43, *Unbound and hydraulically bound mixtures — Part 43: Test method for the determination of the modulus of elasticity of hydraulically bound mixtures*

EN 13286-45, *Unbound and hydraulically bound mixtures — Part 45: Test method for the determination of the workability period of hydraulically bound mixtures*

EN 13286-47, *Unbound and hydraulically bound mixtures — Part 47: Test methods for the determination of California bearing ratio, immediate bearing index and linear swelling*

prEN 13286-50, *Unbound and hydraulically bound mixtures — Part 50: Methods for the manufacture of test specimens of hydraulically bound mixtures using Proctor equipment or vibrating table compaction*

prEN 13286-51, *Unbound and hydraulically bound mixtures — Part 51: Method for the manufacture of test specimens of hydraulically bound mixtures by vibrating hammer compaction*

prEN 13286-52, *Unbound and hydraulically bound mixtures — Part 52: Method for the manufacture of test specimens of hydraulically bound mixtures by vibrocompression*

prEN 13286-53, *Unbound and hydraulically bound mixtures — Part 53: Method for the manufacture of test specimens of hydraulically bound mixtures by axial compression*

3 Terms and definitions

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

3.1

hydraulically bound mixture

mixture which sets and hardens by hydraulic reaction

3.2

hydraulic road binder bound mixture

hydraulically bound mixture where hydraulic road binder is the binder

3.3

slenderness ratio

height to diameter ratio of the specimen

3.4

compacity

ratio of the absolute volume of the solid to the apparent volume of the mixture (see annex A)

4 Symbols and abbreviations

For the purpose of this document, the following symbols and abbreviations apply.

R_c is the compressive strength, expressed in megapascals (MPa);

R_t is the direct tensile strength, expressed in megapascals (MPa);

R_{it} is the indirect tensile strength, expressed in megapascals (MPa);

E is the modulus of elasticity, expressed in megapascals (MPa);

E_c is the E determined by compression, expressed in megapascals (MPa);

E_t is the E determined in direct tension, expressed in megapascals (MPa);

E_{it} is the E determined in indirect tension, expressed in megapascals (MPa).

5 Constituents

5.1 Hydraulic road binder

Hydraulic road binder shall comply with ENV 13282 or with an European approval or equivalent or with the provisions valid in the place of use.

5.2 Aggregates

Aggregates shall be selected from EN 13242.

The properties and the appropriate categories of the aggregates shall be specified depending on the position of the hydraulic road binder bound mixture in the pavement structure and the traffic to be carried.

NOTE Siliceous fly ash conforming to EN 14227-4 may be used as an addition to the aggregates.

Aggregates shall be volumetrically stable. When this is not the case, the use of the mixture shall be permitted provided there is a satisfactory performance record or a thorough laboratory evaluation of the mixture has been carried out in accordance with provisions valid at the place of use.

5.3 Water

Water shall not contain components which adversely affect the hardening and the performance of the hydraulic road binder bound mixtures.

5.4 Retarders

Retarders shall comply with provisions valid in the place of use.

NOTE Generally retarders are not necessary.

6 Hydraulic road binder bound mixtures

6.1 Types

Hydraulic road binder bound mixture shall be made from the constituents specified in 5.

The mixture shall be selected from the 4 types described below and shall conform to the specified requirements for the selected mixture.

6.2 Water content

The water content shall be selected to permit compaction on site by rolling and to optimize the mechanical performance of the mixture. The water content shall be determined by the Proctor test or other method in accordance with EN 13286-1 to 5 and limits set to give a workable range of water content on site compatible with the compaction and the desired mechanical performance of the mixture.

6.3 Proportioning of the constituents, grading and dry density

The proportioning of the constituents, expressed as a percentage by dry mass of the total dry mass of the mixture, the grading and the dry density of the mixture, shall be declared. The declared proportions shall be based on the laboratory mixture design and/or practical experiences with mixtures produced with the same constituents and under the same conditions in a way that the mixture complies with the requirements of this document.