Unbound and hydraulically bound mixtures —

Part 50: Method for the manufacture of test specimens of hydraulically bound mixtures using Proctor equipment or vibrating table compaction

The European Standard EN 13286-50:2004 has the status of a British Standard

ICS 93.080.20

National foreword

This British Standard is the official English language version of EN 13286-50:2004.

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

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Unbound and hydraulically bound mixtures - Part 50: Method for the manufacture of test specimens of hydraulically bound mixtures using Proctor equipment or vibrating table compaction

Mélanges traités et mélanges non traités aux liants hydrauliques - Partie 50: Méthode de confection par compactage avec un appareillage Proctor ou une table vibrante des éprouvettes de matériaux traités aux liants hydrauliques

Ungebundene und hydraulisch gebundene Gemische - Teil 50: Verfahren zur Herstellung von Probekörpern von hydraulisch gebundenen Gemischen durch Verdichtung mit Proctorgerät oder Vibrationstisch

This European Standard was approved by CEN on 12 November 2004.

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Contents

Foreword

This document (EN 13286-50:2004) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

This document is one of a series of documents as listed below.

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 13286-7, *Unbound and hydraulically bound mixtures Part 7: Cyclic load triaxial test for unbound mixtures*

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 13286-44, *Unbound and hydraulically bound mixtures Part 44: Test method for the determination of the alpha coefficient of vitrified blast furnace slag*

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

EN 13286-46, *Unbound and hydraulically bound mixtures Part 46: Test method for the determination of the moisture condition value*

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

prEN 13286-48, *Unbound and hydraulically bound mixtures — Part 48: Test method for the determination of degree of pulverisation*

EN 13286-49, *Unbound and hydraulically bound mixtures — Part 49: Accelerated swelling test for soil treated by lime and/or hydraulic binder*

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

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

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

EN 13286-53, *Unbound and hydraulically bound mixtures — Part 53: Methods for the manufacture of test specimens of hydraulically bound mixtures using axial compression*

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1 Scope

This document specifies a test method for making cylindrical specimens of hydraulically bound mixture to a predetermined density using Proctor equipment or vibrating table compaction. The method is appropriate for mixtures, or that part of a mixture, containing aggregate up to a maximum size of 31,5 mm.

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 13286-2:2004, *Unbound and hydraulically bound mixtures Part 2: Test methods for the determination of the laboratory reference density and water content Proctor compaction*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13286-2:2004 and the following apply.

3.1

Proctor rammer or vibrating table compaction

method for making laboratory test specimens of hydraulically bound mixtures by compacting the mixture into a Proctor mould of known volume using either Proctor rammer compaction or high frequency vibration table until a predetermined density is achieved

4 Principle

Cylindrical test specimens of the mixture are prepared using Proctor moulds conforming to EN 13286-2. The mould is filled with the mixture in a specified manner and the mixture is compacted to a predetermined density by a Proctor rammer conforming to EN 13286-2 or by vibrating table conforming to EN 13286-5. After compaction, the specimens are stored, moulded or demoulded, at a specified temperature, moisture condition and period of time until required for testing.

5 Dimensions of the specimens

Specimens shall conform to the dimensions given in Table 1.

Table 1 — Specimen dimensions

Column	1	2	3
Line	d mm	h mm	Maximum size of particle permitted in the specimen mm
1	100 ± 1	120 ± 1	16 [a]
2	150 ± 1	120 ± 1	31,5
a or 22,4 mm on the basis of experience			

6 Apparatus

6.1 Moulds, conforming to EN 13286-2. The mould size shall be selected from Table 1.

The moulds shall have extension collars not less than 100 mm high to facilitate filling.

NOTE To facilitate demoulding, the use of split moulds may be appropriate.

6.2 Rammers, conforming to EN 13286-2.

6.3 Vibrating table, conforming to EN 13286-5.

A surcharge plug of a suitable mass (usually up to 12 kg) shall be used. The surcharge plug shall fit inside the extension collar and shall have gradations to judge that the required height of the specimen is achieved.

NOTE The weight of the surcharge depends on the nature of the material and the size of the mould.

7 Procedure

7.1 Mixture

Calculate the mass of the mixture required using the following formula:

$$m = V \times \rho_d \times \left(1 + \frac{w}{100}\right)$$

where

m is the mass of the specimen, in grams (g);

V is the volume of the specimen, in cubic millimetres (mm^3);

ρ_d is the dry density of the specimen, in megagrams per cubic metre (Mg/m^3);

w is the water content of the dry mass of the mixture, in percent (%).

NOTE The values of dry density and water content used in the formula will vary according o experience and practice. For example, the values may correspond to the Proctor density and the optimum water content or optimum water content –1 %.

6

7.2 Compaction by rammer

Prepare and compact the specimen in accordance with EN 13286-2, selecting the combination of mould and rammer to achieve the required density. Choose the numbers of blows for each layer such that the required density is achieved throughout the depth of the specimen.

Before the next layer is added, scarify the previously compacted layer to achieve adhesion between the layers.

NOTE To determine the number of blows, pre-tests may be necessary.

The density of each specimen shall not deviate by more than 0,02 Mg/mm^3 from the required density. Calculate the density using the real volume of the specimen.

7.3 Compaction by vibrating table

Place the total quantity of mixture into the mould using the extension collar. During filling, tamp the material gently and uniformly using a tamper. Place the surcharge plug on the top and compact the mixture using vibration until the required height of specimen is achieved.

The density of each specimen shall not deviate more than 0,02 Mg/mm^3 from the required density. The density of the specimen shall be calculated using the measured dimensions of the specimen.

8 Storage

After hardening sufficiently but not sooner than 20 h after compaction, demould the specimen. Prior to demoulding, the specimen shall be maintained at a temperature of (20 ± 5) °C without loss of moisture.

After demoulding, specimens shall be stored

vertically,

preventing loss of moisture,

at a temperature within ±2 °C of the specified temperature,

for the time specified in the relevant mixture document.

9 Test report

The test report shall include the following information:

a) reference to this document;

b) type of mixture;

c) origin of the mixture;

d) preparation of the mixture where necessary;

e) method of compaction (rammer, vibrating table);

f) if applicable the mould and rammer used;

g) the mass, water content and dry density of the specimen immediately after compaction;

h) proctor density and the optimum water content if relevant;

i) any deviations from this document as well as any incidents that could have an effect on the result.

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BS EN
13286-50:2004

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