Unbound and hydraulically bound mixtures - Part 4: Test methods for laboratory reference density and water content - Vibrating hammer

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13286-4:2021 sisaldab Euroopa standardi EN 13286-4:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 13286-4:2021 consists of the English text of the European standard EN 13286-4:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.11.2021.	Date of Availability of the European standard is 10.11.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Unbound and hydraulically bound mixtures - Part 4: Test methods for laboratory reference density and water content - Vibrating hammer

Mélanges traités et mélanges non traités aux liants hydrauliques - Partie 4: Méthode d'essai de détermination en laboratoire de la masse volumique apparente sèche de référence et de la teneur en eau - Marteau vibrant

Ungebundene und hydraulisch gebundene Gemische - Teil 4: Laborprüfverfahren für die Trockendichte und den Wassergehalt - Vibrationshammer

This European Standard was approved by CEN on 5 July 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (EN 13286-4:2021) has been prepared by Technical Committee CEN/TC 227 "Road Materials", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13286-4:2003.

In comparison with the previous edition, the following technical modifications have been made:

— editorial changes;

— removal of the particle size requirement at 20mm which was considered unnecessary and contrary to current usage;

— advice on the use of the test method with absorbent aggregates, soils and hydraulically bound mixtures;

— the inclusion of text relating to the possible types of compaction curves and definition/selection of the resulting optimum water content;

— removal of the Annex: Compactibility test for graded aggregates, which was deemed unnecessary.

This document is one of a series of standards as follows:

— 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 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 of 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 blastfurnace 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*

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

— EN 13286-49, *Unbound and hydraulically bound mixtures – Part 49: Test method for the determination of the accelerated swelling of 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: Method for the manufacture of test specimens of hydraulically bound mixtures using axial compression*

— CEN/TS 13286-54, *Unbound and hydraulically bound mixtures – Part 54: Test method for the determination of frost susceptibility – Resistance to freezing and thawing of hydraulically bound mixtures*

Annex A is normative.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies a method for the determination of the relationship between the dry density and water content of a mixture using vibrating hammer compaction.

This document applies to mixtures which contain no more than 10 % by mass of the mixture retained on the 40 mm test sieve.

This document also describes the procedure for calculating and plotting the curves corresponding to 0 %, 5 % and 10 % air voids.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 932-2, *Tests for general properties of aggregates - Part 2: Methods for reducing laboratory samples*

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

EN 1097-5, *Tests for mechanical and physical properties of aggregates - Part 5: Determination of the water content by drying in a ventilated oven*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13286-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 Principle

The mixture is compacted into a cylindrical mould using an electrically powered vibrating hammer over a range of water contents. The range includes the optimum water content at which the maximum dry density for the specified degree of compaction is obtained. The relationship between dry density and water content is described in EN 13286-1.

5 Apparatus

5.1 Cylindrical, corrosion resistant, Proctor mould B in accordance with EN 13286-2 (see also Figure 1). The internal faces shall be smooth, clean and dry before use.

5.2 Detachable baseplate and removable extension piece, to fit the mould (see Figure 1).

5.3 Electrically powered vibrating hammer, conforming to the performance check in Annex A.

NOTE A vibrating hammer with a power consumption of at least 600 W, an operating frequency between 25 Hz and 60 Hz, and fitted with a suitable safety circuit breaker would be suitable.