

**Sidumata ja hüdrauliliselt seotud segud - Osa 2: Kuiva tiheduse ja veesisalduse laboratoorse määramise katsemeetodid - Proctor-teim**

Unbound and hydraulically bound mixtures - Part 2: Test methods for laboratory reference density and water content - Proctor compaction

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Kuivtiheduse ja veesisalduse laboratoorse määramise  
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Unbound and hydraulically bound mixtures - Part 2: Test  
methods for laboratory reference density and water content -  
Proctor compaction

English Version

Unbound and hydraulically bound mixtures - Part 2: Test  
methods for laboratory reference density and water content -  
Proctor compaction

Mélanges traités et mélanges non traités - Partie 2:  
Méthodes d'essai de détermination en laboratoire de la  
masse volumique de référence et de la teneur en eau -  
Compactage Proctor

Ungebundene und hydraulisch gebundene Gemische - Teil  
2: Laborprüfverfahren zur Bestimmung der Dichte und des  
Wassergehaltes - Proctorversuch

This European Standard was approved by CEN on 22 July 2010.

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## Foreword

This document (EN 13286-2:2010) 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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

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 supersedes EN 13286-2:2004.

This document is one of a series of standards 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 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 methods 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 degrees 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*

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies test methods for the determination of the relationship between the water content and the dry density of hydraulically bound or unbound mixtures after compaction under specified test conditions using Proctor compaction. It allows an estimate of the mixture density that can be achieved on construction sites and provides a reference parameter for assessing the density of the compacted layer of the mixture.

This European Standard applies only to unbound and hydraulically bound mixtures of aggregates used in road construction and civil engineering work. It is not applicable to soils for earthworks. The results of this test method can be used as a basis for comparing mixtures before use in road construction. The test results also allow a conclusion to be drawn as to the water content at which mixtures can be satisfactorily compacted in order to achieve a given dry density.

This test is suitable for mixtures with different values of upper sieve ( $D$ ) size up to 63 mm and an oversize up to 25 % by mass.

## 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 933-2, *Tests for geometrical properties of aggregates — Part 2: Determination of particle size distribution — Test sieves, nominal size of apertures*

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

EN 13286-1:2003, *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 13286-1:2003 and the following apply.

### 3.1

#### **Proctor density**

laboratory reference density determined from the dry density/water content relationship obtained by the Proctor test with a specific energy of approximately  $0,6 \text{ MJ/m}^3$

### 3.2

#### **modified Proctor density**

laboratory reference density determined from the dry density/water content relationship obtained by the modified Proctor test with a specific energy of about  $2,7 \text{ MJ/m}^3$

### 3.3

#### **initial water content** $w_{0i}$

water content of a given mixture sample  $i$  before compaction