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English version

**Geotechnical investigation and testing - Laboratory testing of
soil - Part 5: Incremental loading oedometer test (ISO/TS 17892-
5:2004)**

Reconnaissance et essais géotechniques - Essais de sol
au laboratoire - Partie 5: Essai à l'oedomètre sur sol saturé
(ISO/TS 17892-5:2004)

Geotechnische Erkundung und Untersuchung -
Laborversuche an Bodenproben - Teil 5:
Oedometerversuch mit stufenweiser Belastung (ISO/TS
17892-5:2004)

This Technical Specification (CEN/TS) was approved by CEN on 2 December 2003 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Contents

Foreword.....	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Symbols	7
5 Equipment	8
5.1 Requirements	8
5.2 Calibration	11
5.3 Environment	12
6 Test procedure	12
6.1 General requirements	12
6.2 Specimen preparation	12
6.3 Measurement and protection	13
7 Test results	17
7.1 General	17
7.2 Initial values	17
7.3 Compressibility characteristics	18
8 Test report	19
8.1 Mandatory reporting	19
8.2 Optional reporting	19
Annex A (informative) Additional calculations	21
A.1 Additional symbols	21
A.2 Soil condition	22
A.3 Compressibility parameters	22
A.4 Swelling parameters	24
Bibliography	30

Figures

Figure 1 — General arrangements of typical oedometer cells	9
Figure 2 — Typical plot of void ratio against vertical effective stress	16
Figure A.1 — Change of effective stress and vertical strain for incremental loading and unloading	23
Figure A.2 — Change of effective stress and void ratio for incremental loading and unloading	23
Figure A.3 — Laboratory consolidation curve: example of log time fitting method	25
Figure A.4 — Laboratory consolidation curve: example of square root of time fitting method	26
Figure A.5 — Temperature correction curve for coefficient of consolidation	27
Figure A.6 — Derivation of coefficient of secondary compression C_{α}	28
Figure A.7 — Determination of the apparent preconsolidation pressure σ'_p	29

Tables

Table 1 — Suggested initial pressure	14
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Foreword

This document (CEN ISO/TS 17892-5:2004) has been prepared by Technical Committee CEN/TC 341 "Geotechnical investigation and testing", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 182 "Geotechnics".

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CEN ISO/TS 17892 consists of the following parts, under the general title *Geotechnical investigation and testing — Laboratory testing of soil*:

- Part 1: Determination of water content
- Part 2: Determination of density of fine grained soil
- Part 3: Determination of particle density - Pycnometer method
- Part 4: Determination of particle size distribution
- Part 5: Incremental loading oedometer test
- Part 6: Fall cone test
- Part 7: Unconfined compression test on fine grain soils
- Part 8: Unconsolidated undrained triaxial test
- Part 9: Consolidated triaxial compression tests on water saturated soils
- Part 10: Direct shear tests
- Part 11: Determination of permeability by constant and falling head
- Part 12: Determination of the Atterberg limits

Introduction

This document covers areas in the international field of geotechnical engineering never previously standardised. It is intended that this document presents broad good practice throughout the world and significant differences with national documents is not anticipated. It is based on international practice (see [1]).

1 Scope

This document is intended for determination of the compression, swelling and consolidation properties of soils. The cylindrical test specimen is confined laterally, is subjected to discrete increments of vertical axial loading or unloading and is allowed to drain axially from the top and bottom surfaces.

The main parameters derived from the oedometer test relate to the compressibility and rate of primary consolidation of the soil. Estimates of preconsolidation pressure, rate of secondary compression, and swelling characteristics are sometimes also obtainable.

The main parameters which can be derived from the oedometer test carried out on undisturbed samples are:

- 1) compressibility parameters;
- 2) coefficient of consolidation;
- 3) apparent preconsolidation pressure or yield stress;
- 4) coefficient of secondary compression;
- 5) swelling parameters.

The fundamentals of the incremental loading oedometer test include:

- stress path corresponds to one-dimensional straining;
- drainage is one-dimensional and axial.

The stress paths and drainage conditions in foundations are generally three dimensional and differences can occur in the calculated values of both the magnitude and the rate of settlement.

The small size of the specimen generally does not adequately represent the fabric features present in natural soils.

Analysis of consolidation tests is generally based on the assumption that the soil is saturated. In case of unsaturated soils, some of the derived parameters may have no physical meaning.

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.

prEN 1997-2, *Eurocode 7 - Geotechnical design — Part 2: Ground investigation and testing*.

CEN ISO/TS 17892-1, *Geotechnical investigation and testing — Laboratory testing of soil — Part 1: Determination of water content (ISO/TS 17892-1:2004)*.

CEN ISO/TS 17892-2, *Geotechnical investigation and testing — Laboratory testing of soil — Part 2: Determination of density of fine grained soil (ISO/TS 17892-2:2004)*.