SLOVENSKI STANDARD

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Karakterizacija blata ï Filtracijske lastnosti ï 3. del: Dolo ̣ anje stisljivosti

Characterization of sludges - Filtration properties - Part 3: Determination of the compressibility

Charakterisierung von Schlämmen - Filtrationseigenschaften - Teil 3: Bestimmung der Kompressibilität

Caractérisation des boues - Propriétés de filtration - Partie 3 : Détermination de la compressibilité

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This European Standard was approved by CEN on 24 May 2006.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This document (EN 14701-3:2006) has been prepared by Technical Committee CEN/TC 308 “Characterization of sludges”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

Other parts of this European Standard are:

— Part 1: Capillary suction time (CST);

— Part 2: Determination of the specific resistance to filtration.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 United Kingdom.

Introduction

The measurement of compressibility is complementary to that of specific resistance to filtration (see EN 14701-2). The scope of this determination is to evaluate the best range of pressure to be adopted for filtration. This parameter can be used together with other parameters to evaluate the performance of full-scale filtration devices.

1 Scope

This document specifies a method to determine the compressibility of sludges, conditioned or not.

This document is applicable to sludges and sludge suspensions from:

— storm water handling;

— urban wastewater collecting systems;

— urban wastewater treatment plants;

— treating industrial wastewater similar to urban wastewater (as defined in Directive 91/271/EEC);

— water supply treatment plants.

This method is also applicable to sludge and sludge suspensions of other origin.

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 12832:1999, *Characterization of sludges — Utilization and disposal of sludges — Vocabulary*

EN 14701-2:2006, *Characterization of sludges — Filtration properties — Part 2: Determination of the specific resistance to filtration*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12832:1999 and the following apply.

3.1
compressibility
ability of a suspension to be compressed under pressure

3.2
compressibility coefficient
slope of the straight line obtained by plotting a log-log scale the specific resistance to filtration versus pressure

4 Principle

Measurement of the specific resistance to filtration of a sludge at different pressures.

5 Apparatus

Filtration apparatus as described in 5.1.2, 5.1.3, 5.2 and 5.4. to 5.8 of EN 14701-2:2006.

6 Procedure

Measure the values of the specific resistance to filtration at least at three different pressures, following the procedure reported in the relevant method (see 6.2 or 6.3 of EN 14701-2:2006). The following values are suggested: 50 kPa, 150 kPa and 500 kPa.

7 Expression of results

The coefficient of compressibility, s is related to the applied pressure p by the equation (1):

$$r = r_o \times p^s \tag{1}$$

where

r_o is the specific resistance to filtration at pressure = 100 kPa;

r is the specific resistance to filtration at pressure p;

p is the pressure drop across the cake and cloth in Pascals (Pa);

s is the coefficient of the compressibility.

Introducing logarithms, results:

$$\log r = \log r_o + s \times \log p \tag{2}$$

Plotting on a log-log scale diagram r versus p, a straight line having a slope s is obtained. The value of s is calculated considering two points of the line r-p having respectively, co-ordinates (r_1, p_1) and (r_2, p_2) by equation (3):

$$s = (\log r_2 / r_1)/(\log p_2 / p_1) \tag{3}$$

NOTE Values of s higher than 1 indicate an increase of the specific resistance to filtration more than proportional to the pressure, thus it is not convenient to operate at high pressures (see clause 6).

8 Precision

Precision is referred to that of the Determination of the specific resistance to filtration (EN 14701-2).

9 Test report

The test report shall contain the following information:

a) reference to this document;

b) all information necessary for the complete identification of the sample;

c) method with a reference to this document;

d) test results obtained;

e) any detail not specified in this document or which is optional and any other factor which may have affected the results.