SLOVENSKI STANDARD
kSIST-TS FprCEN/TS 16202:2011

01-januar-2011

Blato, obdelani biološki odpadki in tla - Določevanje nečistoč in kamnov

Sludge, treated biowaste and soil - Determination of impurities and stones

Schlamm, behandelter Bioabfall und Boden - Bestimmung von Fremdstoffen und Steinen

Boue, biodéchet traité et sol - Détermination des matières étrangères et pierres

Ta slovenski standard je istoveten z: **FprCEN/TS 16202**

ICS:

13.030.20	Tekoči odpadki. Blato	Liquid wastes. Sludge
13.080.20	Fizikalne lastnosti tal	Physical properties of soils

kSIST-TS FprCEN/TS 16202:2011 **en,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

FINAL DRAFT FprCEN/TS 16202

November 2010

ICS

English Version

Sludge, treated biowaste and soil - Determination of impurities and stones

Boue, biodéchet traité et sol - Détermination des matières étrangères et pierres

Schlamm, behandelter Bioabfall und Boden - Bestimmung von Fremdstoffen und Steinen

This draft Technical Specification is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee CEN/TC 400.

CEN members are the national standards bodies of 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 United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a Technical Specification. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a Technical Specification.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. FprCEN/TS 16202:2010: E

Contents

Page

Foreword

This document (FprCEN/TS 16202:2010) has been prepared by Technical Committee CEN/TC 400 “Project Committee - Horizontal standards in the fields of sludge, biowaste and soil”, the secretariat of which is held by DIN.

This document is currently submitted to the Formal Vote.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This Technical Specification is part of a modular horizontal approach in which this document belongs to the analytical step.

The preparation of this document by CEN is based on a mandate by the European Commission (Mandate M/330). The mandate considers standards on sampling and analytical methods for hygienic and biological parameters as well as inorganic and organic determinants. It was the aim of the mandate to develop standards that are applicable to sludge, treated biowaste and soil and lead to equivalent results as far as this is technically feasible.

Until now test methods determining properties of materials within the environmental area were prepared in Technical Committees (TCs) working on specific products/matrices (soil, waste, sludge, etc.). However, it is recognized that many steps in test procedures can be used in test procedures for other products/matrices. By careful determination of these steps and selection of specific questions within these steps, elements of the test procedure can be described in a way that can be used for more matrices and materials with certain specifications. This optimization is in line with the development among end-users of standards. A majority of routine environmental analyses are carried out by institutions and laboratories working under a scope which is not limited to one single environmental matrix but covers a wide variety of matrices. Availability of standards covering more matrices contributes to the optimization of laboratory procedures and standard maintenance costs, e.g. costs related to accreditation and recognition.

A horizontal modular approach was developed in the project "Horizontal". "Modular" means that a test standard developed in this approach concerns a specific step in assessing a property and not the whole "chain of measurement" (from sampling to analyses). A beneficial feature of this approach is that "modules" can be replaced by better ones without jeopardizing the standard "chain".

The results of the desk study as well as the evaluation and validation studies have been subject to discussions with all parties concerned in the CEN structure during the development by project "Horizontal". The results of these consultations with interested parties in the CEN structure have been presented to and discussed in CEN/TC 400.

Introduction

This Technical Specification is (applicable and) validated for several types of matrices as indicated below (see also Annex B for the results of the validation).

Table 1 — Matrices for which this Technical Specification is (applicable and) validated

Matrix	Validated for
Sludge	Sewage sludge
Compost	Horticultural green compost
	Mixture of municipal and green compost (1:1)
Soil	Sandy soil with some organic matter

WARNING — Care shall be taken when handling samples, since they may contain sharp fragments, chemical contaminants or possible pathogenic organisms. When using bleach, care shall be taken to avoid inhaling fumes containing Cl_2.

1 Scope

This Technical Specification specifies a method to determine the physical impurities > 2 mm and stones > 5 mm in sludge, treated biowaste and soil.

Pieces of wood or bark are acceptable constituents of the samples and not considered as impurities.

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 12579:1999, *Soil improvers and growing media — Sampling*

EN 13040:2007, *Soil improvers and growing media — Sample preparation for chemical and physical tests, determination of dry matter content, moisture content and laboratory compacted bulk density*

CR 13456:1999, *Soil improvers and growing media — Labelling, specifications and product schedules*

ISO 3310-1:2000, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth* (including Technical Corrigendum 1:2004)

ISO 3310-2:1999, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CR 13456:1999, EN 12579:1999 and EN 13040:2007 and the following apply.

3.1
stone
unattached pieces of rock 2 mm in diameter or larger that are strongly cemented or more resistant to rupture

[Soil Science Society of America, 2001]

NOTE 1 Rock being hard consolidated mineral matter.

NOTE 2 Limestone, including added limestone, is counted as stone.

3.2
glass
material consisting mostly of presumably man-made hard not crystallized minerals

3.3
metal
material consisting mostly of metals

3.4
plastics
material consisting mostly of presumably man-made synthetics

3.5
other material
unexpected material not accounted for in the method

NOTE It will at least be recorded in weigh but should be labelled qualitatively when possible, e.g. "mainly leather fragments".

4 Principle

After drying, the sample is dry sieved, then, if necessary, either water-washed and/or bleach-washed and wet sieved on a 2 mm sieve (as necessary). The fraction > 2 mm are again dried when necessary and the fractions of stones > 5 mm and differentiated impurities > 2 mm are determined by weight or, for plastics, by weight and area.

NOTE The purpose of measuring both, the weight and the area of plastics, is to characterise two aspects of the contamination with plastics. Weight characterises the sheer bulk of plastics present. Area characterises the visual presence of plastics.

5 Reagents

5.1 Bleach, 9,6 % chlorine (48° in other units).

This is a mixture of sodium hypochloride (NaClO, sometimes written as NaOCl), sodium chloride (NaCl) and sodium hydroxide (NaOH). The acceptable range is 7,2 % to 9,6 % (or 36° to 48°).

Bleach should be used in specific cases only.

When using bleach (according to 7.2.2), fumes are to be force ventilated away through an appropriate filter such as an active carbon filter. This will result in a filter containing Cl_2 which is to be replaced at specified intervals and handled as chemical waste. Any excess bleach must be poured off through an appropriate filter such as an active carbon filter. When bleach-washing the samples (as in 7.2.2) all liquid residues shall also be disposed of through this filter.

5.2 Water, drinking water quality, tap water or purer.

6 Apparatus

6.1 Sample tray, constructed of material thermally stable up to 150 °C, surface approximately 1 250 cm^2.

6.2 Drying oven, ventilated, fan assisted, capable of holding sample trays at (80 ± 3) °C.

6.3 Balance, maximum load 2 kg with an accuracy of 0,01 g.

6.4 Container, nominal capacity 10 l.

6.5 Extractor hood.

Any fumes containing chlorine (Cl_2) shall be safely removed by using an extractor hood or fume cupboard using forced ventilation and a suitable fume filter, such as an active carbon filter.

6.6 Skin protection.

Usual laboratory wear and synthetic gloves to avoid skin contact with bleach whenever bleach is used.

6.7 Eye protection.

Laboratory goggles or a face shield to protect the eyes from bleach droplets when bleach is used.

6.8 Glass rod, 40 cm to 60 cm to stir the solution in the container.

It should be resistant against bleach and temperatures up to 100 °C.

6.9 Sieves, diameter 200 mm or 300 mm, with 2 mm, 5 mm and 40 mm apertures, according to ISO 3310-1:2000 or ISO 3310-2:1999.

6.10 Beaker, nominal capacity 300 ml.

6.11 Tweezers/forceps.

6.12 Camera and graph paper.

6.13 Temperature measuring device, capable of measuring up to 100 °C.

7 Procedure

7.1 Sample preparation

7.1.1 Large objects

Prepare the test sample in accordance with EN 13040:2007, 8.1 and 8.2. Where 80 % (mass fraction) or more of the sample passes a 40 mm sieve (6.9), the procedure can be continued. If not, the method is not applicable because the material contains too many large objects.

7.1.2 Amount of laboratory sample

Determine the amount of sample to be analysed depending on the coarseness of the sample. For a sample with particles:

— up to 100 mm in size, take 7,5 l material;

— up to 40 mm in size, take 3 l material;

— up to 25 mm in size, take 1,5 l material;

— up to 12 mm, take 1 l material.

Then put the sample in the sample tray (6.1).

7.1.3 Drying

Dry the materials for at least 16 h at (80 ± 3) °C in a drying oven (6.2) until constant weight.

7.1.4 Weighing

Determine the mass of the dried sample using the balance (6.3).

7.1.5 Dry sieving

Using the beaker (6.10), sieve the entire dried sample by transferring portions of 100 ml using a 2 mm sieve (6.9). Record the weight of all material < 2 mm particle size and discard this portion. Keep the rest for the further investigation.

NOTE Discarding the material < 2 mm will facilitate the choice for sieve analysis without washing (see 7.2) and will substantially reduce the amount of bleach necessary if bleach is used (see 7.3). The fractioning of the dried samples into 100 ml portions is to prevent clogging of the sieve as well as to ensure proper recognition of impurities.

7.2 Direct analysis without washing

If the different impurities can be easily discriminated by eye, the sample may be subjected to dry sieve analysis (see 7.4) without prior washing. If the different impurities are coated with any matter which hinders visual discrimination, the sample shall be water- or bleach-washed (see 7.3).

7.3 Analysis using water and/or bleach washing

7.3.1 General

For samples with visibly low organic matter content, stirring the material for 5 min with water instead of bleach is allowed. An organic matter content of < 15,0 % (by mass) of the dry sample serves as an indicative criterion. If there is any doubt about the proper discrimination and classification of impurities, bleach washing shall be performed.

All the steps specified in 7.3.3 ff shall be carried out under fume extraction.

NOTE For some samples it may be necessary to carry out the bleach treatment following a water washing.

7.3.2 Water washing

7.3.2.1 First washing

Put portions of up to 1 500 ml of the weighed dry material (see 7.1.5) in a 10 l container (6.4). Cover the sample with 2 l water (5.2) and stir with a glass rod (6.8) for 5 min. Finally pour the sample on a sieve (6.9) with 2 mm aperture and wash through with water.

7.3.2.2 Second washing

Put the fraction > 2 mm (see 7.3.2.1) back into the container (6.4) and repeat the previous step (see 7.3.2.1).

7.3.3 Bleach washing

7.3.3.1 First washing

Put portions of up to 1 500 ml of the weighed dry material (see 7.1.5) in a 10 l container (6.4). Place the container under an extractor hood (6.5) to safely and continuously remove chlorine gases formed.

Use skin protection (6.6) and eye protection (6.7).

Add bleach until the sample is submerged under 5 mm bleach with a maximum of 2 l bleach (5.1) and stir with a glass rod (6.8). The chemical reaction is exothermic, very quick and produces large quantities of fumes. To minimise possible overflows do not stir until the temperature is below 80 °C (6.13). Prevent the formation of a gaseous cake on the liquid during the first 15 min by breaking the cake gently with the glass rod (6.8).

The material shall be in contact with the bleach for 2 h.