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Sludge recovery, recycling, treatment and disposal — Protocol for validating methods for physical properties of sludges

Valorisation, recyclage, traitement et élimination des boues — Protocole de validation des méthodes de détermination des propriétés physiques des boues

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by the European Committee for Standardization (CEN)(as CEN/TR 15252:2006) and was adopted, without modification other than those given below, by Technical Committee ISO/TC 275, *Sludge recovery, recycling, treatment and disposal*.

— The applicability of the document has been defined in the Scope;

— Clause 3 has been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

To be published as an ISO document, all the methods for physical properties of sludges need to be validated through interlaboratory trials.

Validation usually consists in analysing reference samples circulated to many laboratories in different countries and in evaluating the repeatability and reproducibility of measurements.

— Repeatability is defined as the ability of a method to reproduce a measurement while being tested under an unchanging set of conditions. This does not imply that the obtained value is correct, but rather that it is the same every time.

— Reproducibility is the same as repeatability, but for a specific set of conditions. It is therefore a more realistic indication of a method to reproduce a measurement, whenever a predefined set of conditions is recreated.

However, for physical parameters, with the exception of calorific value, samples of "dried sludge" cannot be used for analysis, but only "fresh sludge" samples, with the consequence that many problems arise because:

— the sludge physical characteristics change with time of storage, also considered that any preservation practice (e.g. freezing) can affect sludge properties;

— the sludge physical characteristics are strongly affected by transport and handling;

— fresh sludge requires particular precautions and authorization for transport by ordinary delivering systems.

Therefore, "fresh sludge" samples need to be examined by laboratories close to wastewater or waterworks plants and analysed as soon as possible, minimising their manipulation, so the circulation of fresh sludge samples to laboratories in several places and in different countries requires well defined procedures to guarantee the reliability of results.

A valid alternative can consist in the examination of "synthetic sludge" samples to be on-site prepared on the base of a defined recipe and ingredients.

Another possibility is carrying out validation tests through "circulation of analysts", and not "circulation of samples", thus allowing analysts from the participating laboratories to meet in a laboratory close to the place where samples are collected.

Finally, if any of the above options cannot be followed, validation can be limited to a "confidence level evaluation" through the statistical evaluation of sludge samples taken in different works and examined in laboratories located close to the respective works.

Therefore, one of the following three procedures should be followed:

— the first by examining "real or synthetic reference" samples in different laboratories (conventional round robin tests);

— the second in examining "reference" samples in one laboratory, close to the place where samples are collected, where analysts from the participating laboratories will meet and work with their own apparatuses (modified round robin tests);

— the third including the statistical evaluation of sludge samples taken in different works and examined in laboratories located close to the respective works (confidence level evaluation).

In all cases, preliminary planning and arrangements are required.

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Sludge recovery, recycling, treatment and disposal — Protocol for validating methods for physical properties of sludges

1 Scope

This document specifies procedures for validating the characterization methods for physical properties of sludge.

The method applies to sludges and suspensions from:

— storm water handling;

— urban wastewater collecting systems;

— urban wastewater treatment plants;

— industrial wastewater that has been treated similarly to urban wastewater;

— water supply plants.

In accordance with ISO/TC 275 scope this document is applicable to sludge and products from urban wastewater collection systems, night soil, storm water handling, water supply treatment plants, wastewater treatment plants for urban and similar industrial waters.

This document is applicable to all sludge that can have similar environmental and/or health impacts with exclusion of hazardous sludge from industry and dredged sludge.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
sludge
accumulated settled solids separated from various types of water as a result of natural or artificial processes

[SOURCE: ISO 6707-1:2020, 3.8.27]

4 Preliminary arrangements

For each material to be tested, the statistical evaluation should be based on the results obtained from at least nine laboratories, of at least three different countries.

National members of interested committees take care to select special laboratories in their countries; these laboratories should preferably have been successfully involved in round robin tests in the past.

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