

---

?

Characterization of sludges - Determination of the loss on ignition of dry mass

Charakterisierung von Schlämmen - Bestimmung des Glühverlustes der Trockenmasse

Caractérisation des boues - Détermination de la perte au feu de la matière sèche

**Ta slovenski standard je istoveten z: EN 12879:2000**

[SIST EN 12879:2001](https://standards.iteh.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001)

<https://standards.iteh.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001>

**ICS:**

13.030.20      Liquid wastes. Sludge

**SIST EN 12879:2001**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 12879:2001

<https://standards.iteh.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 12879

August 2000

ICS 13.030.20

English version

Characterization of sludges - Determination of the loss on  
ignition of dry mass

Caractérisation des boues - Détermination de la perte au  
feu de la matière sèche

Charakterisierung von Schlämmen - Bestimmung des  
Glühverlustes der Trockenmasse

This European Standard was approved by CEN on 5 August 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**iTeh STANDARD PREVIEW**  
(standards for free preview)  
<https://standards.itih.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001>

SIST EN 12879:2001



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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Contents

	Page
Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions.....	4
4 Principle.....	4
5 Interferences.....	5
6 Hazards .....	5
7 Apparatus .....	5
8 Procedure .....	5
9 Expressions of results .....	6
10 Test report .....	6
Annex A (informative) Performance data of the interlaboratory comparison.....	7

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 12879:2001

<https://standards.iteh.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001>

## Foreword

This European Standard 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 February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The annex A is informative.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 12879:2001

<https://standards.iteh.ai/catalog/standards/sist/6f721463-e609-4d2f-b81a-0dbc4ce17b0b/sist-en-12879-2001>

## 1 Scope

This European Standard specifies a method for the determination of the loss on ignition of dry mass of sludges and sludge products at 550 °C after the dry residues have been determined in accordance with the method of EN 12880.

**NOTE** It should be noted that inorganic substances or decomposition products (e.g. H<sub>2</sub>O, CO<sub>2</sub>, SO<sub>2</sub>, O<sub>2</sub>) are released or absorbed and some inorganic substances are volatile under the reaction conditions.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12880, *Characterization of sludges – Determination of dry residue and water content*.

## 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

### 3.1

#### loss on ignition

the portion of mass escaping as gas as a result of the ignition of the dry mass of a sludge under specified conditions. The loss on ignition is related to the dry mass and expressed in percent

### 3.2

#### residue on ignition

the portion of mass remaining after the ignition of the dry mass of a sludge under specified conditions. The residue on ignition is related to the dry mass and expressed in percent

### 3.3

#### dry mass (dry matter)

the mass of solids obtained after the specified drying process. It is expressed as grams or kilograms [EN 12880]

### 3.4

#### constant mass

constant mass is reached when, during the ignition process, the difference between two successive weighings of the sample, first heated, then cooled to room temperature and with an interval of 1 hour between them, is within 0,5 % (*m/m*) of the last determined mass or 2 mg whichever is the greater

## 4 Principle

Samples of dried sludge are heated in a furnace at  $(550 \pm 25)$  °C. The difference in mass before and after the ignition process is used to calculate the loss on ignition.

## 5 Interferences

There are normally no interferences with the loss on ignition determination. However, for many purposes this determination is used as an assessment of the organic part of the sludge dry mass. In this case the loss of volatile inorganic substances can occur giving high results.

NOTE 1 All sewage sludges contain iron in varying quantities and most of it will be present as ferrous iron. During ignition iron (II) will be oxidized to iron (III) with a possible increase in mass and therefore a reduction in the loss on ignition.

NOTE 2 If a sludge has been conditioned with lime the calcium hydroxide or calcium oxide present will be available to combine with sulfur oxides liberated during ignition or with carbon dioxide formed during ignition decreasing the loss on ignition value.

## 6 Hazards

### 6.1 General

Samples are liable to ferment and usually contain harmful micro-organisms. It is essential to keep them away from any food or drink, and to protect any cuts. Bursting glass bottles containing sludge can produce micro-organism contaminated shrapnel. Plastic bottles can also burst and produce a hazardous spray and aerosol.

### 6.2 Storage

It is advisable not to store samples in the open laboratory. If samples are to be stored, store them between 0 °C and 4 °C.

### 6.3 Handling

Cleanliness when working is essential. When handling sludge samples, it is necessary to wear gloves, face and eye protection, and sufficient body protection to guard against bottles bursting. The gas evolved is usually flammable, so all equipment used in the vicinity must be flame proof to avoid any source of ignition.

## 7 Apparatus

7.1 **Crucible**, (50 to 70) mm in diameter, suitable for ignition at 550 °C e.g. porcelain, silica or platinum.

7.2 **Muffle furnace** or equivalent equipment, capable of maintaining a temperature of  $(550 \pm 25)$  °C.

7.3 **Desiccator**, with an active drying agent, such as silica gel or diphosphorus pentoxide.

7.4 **Analytical balance** with an accuracy of 1 mg or better.

## 8 Procedure

If the determination of loss on ignition is carried out in the same crucible as the determination of dry residue, refer to EN 12880 for the initial crucible weighing. If not, the sample is a representative portion of the dry mass obtained according to EN 12880. All the necessary precautions shall be taken to avoid absorption of atmospheric humidity by the sample until it is weighed.

Place a crucible (7.1) in the furnace (7.2) and heat at  $(550 \pm 25)$  °C for at least 30 min. After cooling in the desiccator (7.3) to ambient temperature, weigh to the nearest 1 mg, ( $m_a$ ).

Into the crucible weigh 0,5 g to 5 g of the dried sludge to the nearest 1 mg, ( $m_b$ ), and heat in the furnace (7.2) at  $(550 \pm 25)$  °C for at least 60 min.

NOTE 1 If the dry mass has a high organic content losses can occur as a result of rapid ignition or deflagration of the sample. In this case heat the sample slowly until ignition.

Place the hot crucible containing the residue on ignition in the desiccator and leave to cool.

NOTE 2 If black particles are still present (some organic substances burn only slowly at 550 °C), wet the residue using ammonium nitrate solution prepared by dissolving 10 g of analytical grade ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>) in 100 ml of distilled water. After repeated drying, slowly heat (in order to avoid losses by deflagration) the residue to ignition.

After cooling in the desiccator to ambient temperature, weigh the crucible containing the dry residue to the nearest 1 mg ( $m_c$ ).

Weighing is carried out immediately after removal of the crucible from the desiccator and the weighing operation is completed as quickly as possible. The mass of the residue on ignition and therefore the loss on ignition shall be regarded as constant if the mass obtained after a further half-hour period of ignition at 550 °C in the preheated furnace, ( $m_c - m_a$ ), does not differ by more than 0,5 % of the previous value or 2 mg whichever is the greater (3.4). Otherwise repeat ignition until constant mass has been reached.

NOTE 3 In cases when even after the third heating to 550 °C it is not possible to obtain constant mass, record the value determined as the mean of at least three replicates measured after 1 hour stored in a desiccator. This should be reported together with the result.

## 9 Expressions of results

### 9.1 Calculation

The loss on ignition of the dry mass of a sludge expressed in per cent shall be calculated from equation (1):

$$w_V = \frac{(m_b - m_c)}{(m_b - m_a)} \times 100 \quad (1)$$

The residue on ignition of the dry mass of a sludge expressed in per cent shall be calculated from equation (2):

$$w_R = 100 - w_V \quad (2)$$

where

$w_V$  is the loss on ignition of the dry mass of a sludge or sediment, in percent ;

$w_R$  is the residue on ignition of the dry mass of a sludge or sediment, in percent ;

$m_a$  is the mass of the empty crucible, in grams ;

$m_b$  is the mass of the crucible containing the dry mass, in grams ;

$m_c$  is the mass of the crucible containing the ignited dry mass, in grams.

The results shall be rounded to the nearest 0,1 %.

### 9.2 Precision data

See annex A.

## 10 Test report

The test report shall contain the following information :

- Reference to this European Standard ;
- All information necessary for complete identification of the sludge sample ;
- Results of the determination according to clause 9 ;
- Any detail not specified in this European Standard and any other factor which may have affected the results.