



# SLOVENSKI STANDARD

## SIST EN 12506:2004

01-januar-2004

Nadomešča:  
SIST ENV 12506:2001

---

**Karakterizacija odpadkov - Analiza izlužkov - Določevanje pH, As, Ba, Cd, Cl-, Co, Cr, Cr (VI), Cu, Mo, Ni, (NO<sub>2</sub>)-, Pb, celotnega S, (SO<sub>4</sub>)<sup>2-</sup>, V in Zn**

Characterization of waste - Analysis of eluates - Determination of pH, As, Ba, Cd, Cl-, Co, Cr, Cr VI, Cu, Mo, Ni, NO<sub>2</sub>-, Pb, total S, SO<sub>4</sub><sup>2-</sup>, V and Zn

Charakterisierung von Abfällen - Analyse von Eluaten - Bestimmung von pH, As, Ba, Cd, Cl-, Co, Cr, Cr (VI), Cu, Mo, Ni, NO<sub>2</sub>-, Pb, Gesamt-S, SO<sub>4</sub><sup>2-</sup>, V und Zn

Caractérisation des déchets - Analyse des éluats - Détermination du pH et dosage de As, Ba, Cd, Cl-, Co, Cr, Cr VI, Cu, Mo, Ni, NO<sub>2</sub>-, Pb, S total, SO<sub>4</sub><sup>2-</sup>, V et Zn

**Ta slovenski standard je istoveten z: EN 12506:2003**

---

**ICS:**

13.030.20      Tekoči odpadki. Blato      Liquid wastes. Sludge

**SIST EN 12506:2004**      en

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

[SIST EN 12506:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004>

EUROPEAN STANDARD

EN 12506

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2003

ICS 13.030.99

Supersedes ENV 12506:2000

English version

Characterization of waste - Analysis of eluates - Determination  
of pH, As, Ba, Cd, Cl<sup>-</sup>, Co, Cr, Cr VI, Cu, Mo, Ni, NO<sub>2</sub><sup>-</sup>, Pb, total  
S, SO<sub>4</sub><sup>2-</sup>, V and Zn

Caractérisation des déchets - Analyse des éluats -  
Détermination du pH et dosage de As, Ba, Cd, Cl<sup>-</sup>, Co, Cr,  
Cr VI, Cu, Mo, Ni, NO<sub>2</sub><sup>-</sup>, Pb, total S, SO<sub>4</sub><sup>2-</sup>, V et Zn

Charakterisierung von Abfällen - Analyse von Eluaten -  
Bestimmung von pH, As, Ba, Cd, Cl<sup>-</sup>, Co, Cr, Cr (VI), Cu,  
Mo, Ni, NO<sub>2</sub><sup>-</sup>, Pb, Gesamt-S, SO<sub>4</sub><sup>2-</sup>, V und Zn

This European Standard was approved by CEN on 25 March 2003.

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 Management Centre 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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## EN 12506:2003 (E)

Contents	page
Introduction .....	4
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions .....	5
4 Sample pre-treatment .....	6
5 Blank determination .....	6
6 Interference .....	6
7 Selection of the suitable test method .....	7
8 Expression of results .....	8
9 Test report .....	9
<b>Annex A (informative) Validation of EN 12506 .....</b>	<b>10</b>
A.1 General .....	10
A.2 Interlaboratory study .....	10
A.3 Selection of Laboratories .....	10
A.4 Selection of samples .....	10
A.5 Validation scope .....	11
A.6 Results and statistics .....	13
A.7 Conclusion .....	19
<b>Bibliography .....</b>	<b>20</b>

ITech STANDARD PREVIEW  
(standards.itech.ai)

[SIST EN 12506:2004](https://standards.itech.ai/catalog/standards/sist/41d28dce-5f58-4add-abf6-131d04afb18d/sist-en-12506-2004)

<https://standards.itech.ai/catalog/standards/sist/41d28dce-5f58-4add-abf6-131d04afb18d/sist-en-12506-2004>

## Foreword

This document (EN 12506:2003) has been prepared by Technical Committee CEN/TC 292 "Characterization of waste", the secretariat of which is held by NEN.

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 2003, and conflicting national standards shall be withdrawn at the latest by December 2003.

This document supersedes ENV 12506:2000.

Annex A is informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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

[SIST EN 12506:2004](https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004)

<https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004>

**EN 12506:2003 (E)****Introduction**

This standard is intended to be used for the characterization of waste as defined in the Council Directive 75/442/EEC on waste, as amended by Council Directive 91/156/EEC of 18th March 1991, and national regulations, whose final destination for disposal is landfill.

It deals with the determination of pH and chemical constituents which have been extracted by leaching of waste samples for example using EN 12457 Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludges – Part 1 - 4.

This European Standard together with EN 13370 is intended to define analytical methods for eluates. A large number of compounds can interfere with the determination of the parameters concerned. These potential interferences are listed in the individual standards in question.

For the analytical determinations ENV ISO 13530 and EN ISO/IEC 17025 should be considered.

**1 Scope**

This European Standard specifies methods for the determination of the parameters pH, As, Ba, Cd, Cl<sup>-</sup>, Co, Cr, Cr<sup>VI</sup>, Cu, Mo, Ni, NO<sub>2</sub><sup>-</sup>, Pb, total S, SO<sub>4</sub><sup>2-</sup>, V and Zn in aqueous eluates for the characterization of waste.

**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 (including amendments).

EN 26777	Water quality - Determination of nitrite - Molecular absorption spectrometric method (ISO 6777:1984)
EN ISO 5667-3	Water quality - Sampling - Part 3: Guidance on the preservation and handling of samples (ISO 5667-3:1994)
EN ISO 10304-1	Water quality - Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulfate ions, using liquid chromatography of ions - Part 1: Method for water with low contamination (ISO 10304-1:1992)
EN ISO 10304-2	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 2: Determination of bromide, chloride, nitrate, nitrite, orthophosphate and sulfate in waste water (ISO 10304-2:1995)
EN ISO 11885	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)
EN ISO 11969	Water quality - Determination of arsenic - Atomic-absorption spectrometric method (hydride technique) (ISO 11969:1996)



**EN 12506:2003 (E)****4 Sample pre-treatment**

The eluate shall be analysed for its total content. If precipitation occurs between the preparation of the eluate and the analysis it is necessary to ensure by appropriate methods (e.g. redissolution, separate analysis of solution and precipitate) that the total content of the parameters of interest is determined. If the eluate results from a procedure including 0,45 µm membrane filtration analytical results refer to the content dissolved by the leaching process.

Eluates are susceptible to be changed to different extents as a result of physical, chemical or biological reactions which may take place between the time of leaching and the analysis. pH shall be determined immediately after preparation of the eluates and prior to sample pre-treatment.

It is therefore essential to take the necessary precautions to minimize these reactions and in the case of many parameters to analyse the eluate sample with a minimum of delay. The maximum delay is given in EN ISO 5667-3 or in the analytical standards.

Precautions should be taken before and during transport as well as during the time in which the samples are preserved in the laboratory before being analysed, to avoid alteration of the test portion.

Split the eluate in an adequate number of test portions for different chemical analysis and preserve them according to the requirements in the analytical standards or EN ISO 5667-3.

One specific test portion may be an untreated aliquot of the laboratory sample for analysis of anions such as chloride, sulfate, nitrite and chromium VI.

For trace metal analysis test portions usually need to be acidified to  $\text{pH} \leq 2$ .

NOTE 1 For safety reasons it is recommended to acidify the test portion under a hood as volatile toxic substances can be generated.

NOTE 2 In cases where high contents of soluble solids are leached, acidification of the eluates can lead to precipitation of salts. This can be avoided by dilution prior to acidification.

**5 Blank determination**

The blank contribution of the analysing procedures shall be determined as described in the analytical standards and considered in the calculation of the results when appropriate.

**6 Interference**

Several types of interference effects can contribute to inaccuracies in the determination of the various parameters, especially at low concentrations. These potential interference effects are listed in the individual standards and shall be considered separately for each analytical technique.

Chemical interference is characterized by molecular compound formation, ionization effects, solute vaporization, precipitation and effects of decomposition of organic matter. Addition of buffer and/or preservation methods may reduce these effects.

Physical interference can be caused by changes of viscosity and surface tension. They can cause significant inaccuracies especially in eluate samples containing high concentrations of acids and/or dissolved components. The colour or turbidity of eluates can cause interference in spectrometric determination.

Standard addition may be used to visualise and correct for interference effects (see ISO 8466-3).



## 7 Selection of the suitable test method

Select the appropriate standardized test method listed in Table 1 according to the type of waste eluate, the concentration range of the parameter of interest and the expected interference.

It is pointed out that the standardized test methods listed in Table 1 have primarily been developed for the analysis of water samples. They were validated in a new interlaboratory trial for a limited number of waste eluate matrices (see annex A) performed by CEN/TC 292. Their suitability for other waste eluates has to be checked in the laboratory performing the analysis.

If the methods referred to in Table 1 are found to be inappropriate by reason of, for example, detection limits, repeatability or interference, other methods validated for water analysis such as GF-AAS, ICP-MS can be used. Their suitability for waste eluates has to be checked in the laboratory performing the analysis. The reason for the deviation shall be stated in the test report.

**Table 1 — Parameters and test methods**

Parameter	Test method
pH <sup>a</sup>	ISO 10523
As	EN ISO 11885 EN ISO 11969
Ba	EN ISO 11885
Cd	ISO 8288 EN ISO 11885
Cl	ISO 9297 EN ISO 10304-1 EN ISO 10304-2
Co	EN ISO 11885
Cr	EN ISO 11885
Cr VI	ISO 11083
Cu	ISO 8288 EN ISO 11885
Mo	EN ISO 11885
Ni	ISO 8288 EN ISO 11885
NO <sub>2</sub> <sup>-</sup>	EN 26777 EN ISO 10304-1 EN ISO 10304-2 EN ISO 13395
Pb	ISO 8288 EN ISO 11885
total S	EN ISO 11885
SO <sub>4</sub> <sup>2-</sup>	EN ISO 10304-1 EN ISO 10304-2
V	EN ISO 11885
Zn	ISO 8288 EN ISO 11885
<sup>a</sup>	at pH < 3 or pH > 10 use the same method but be aware that inaccuracy can increase

**EN 12506:2003 (E)****8 Expression of results**

Specific instructions for the calculation of the results given in the individual analytical standards shall be strictly observed.

The results of the tests except for pH shall be expressed as a concentration of the constituents in the eluate, expressed in mg/l. The amount of constituent leached relative to the total mass of the sample, in mg/kg of dry matter, can be calculated using the liquid to solid ratio of the leaching test.

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

[SIST EN 12506:2004](https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004)

<https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004>

## 9 Test report

The work carried out by the testing laboratory shall be covered by a report which accurately, clearly and unambiguously presents the test results and all other relevant information.

Each test report shall include at least the following information:

- a) name and address of testing laboratory;
- b) unique identification of report (such as serial number) and of each page and total number of pages of the report;
- c) description and identification of the laboratory sample;
- d) date of receipt of laboratory sample and date(s) of performance of test;
- e) identification of the test specification or description of the method or procedure;
- f) description of eluate sampling and treatment, where relevant;
- g) any deviations, additions to or exclusions from the test specification, and any other information relevant to a specific test;
- h) measurements, examinations and derived results, supported by tables, graphs, sketches and photographs as appropriate, and any failures identified;
- i) a statement on measurement uncertainty (where needed);
- j) a signature and title or an equivalent marking of person(s) accepting technical responsibility for the test report and date of issue;
- k) a statement that the test results relate only to the laboratory sample;
- l) a statement that the report shall not be reproduced except in full without the written approval of the testing laboratory.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN 12506:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/41d28dec-5f58-4add-abfb-131d04afb18d/sist-en-12506-2004>