



# SLOVENSKI STANDARD

## oSIST prEN 15216:2019

01-oktober-2019

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### Matriksi z vidika okolja - Določevanje celotnih trdnih raztopljenih snovi (TDS) v vodi in izlužkih

Environmental matrices - Determination of total dissolved solids (TDS) in water and eluates

Charakterisierung von Abfällen - Bestimmung des Gesamtgehaltes an gelösten Feststoffen (TDS) in Wasser und Eluaten

Caractérisation des déchets - Détermination de la concentration en matières solides dissoutes totales (TDS) de l'eau et des éluats

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Ta slovenski standard je istoveten z: prEN 15216

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#### ICS:

13.030.20      Tekoči odpadki. Blato      Liquid wastes. Sludge

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 15216**

October 2019

ICS 13.030.20

Will supersede EN 15216:2007

English Version

## Environmental matrices - Determination of total dissolved solids (TDS) in water and eluates - Complementary element

Caractérisation des déchets - Détermination de la concentration en matières solides dissoutes totales (TDS) de l'eau et des éluats

Charakterisierung von Abfällen - Bestimmung des Gesamtgehaltes an gelösten Feststoffen (TDS) in Wasser und Eluaten

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 444.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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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.

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

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## European foreword

This document (prEN 15216:2019) has been prepared by Technical Committee CEN/TC 444 “Test methods for environmental characterization of solid matrices”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15216:2007.

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**prEN 15216:2019 (E)**

## **Introduction**

Total dissolved solids are a common sum parameter which is in use in water analysis and in analysis of eluates.

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## 1 Scope

This document specifies a method for the determination of total dissolved solids (TDS) in water and eluates, provided they are not volatile under the conditions specified or that they do not release water molecules from hydration. It applies to water and eluates containing more than 100 mg/l of total dissolved solids. Samples with lower amounts of dissolved solids can be analysed by repetition of the drying step.

## 2 Normative references

Not applicable.

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

**total dissolved solids**  
**TDS**

$\rho_{TDS}$

mass of dissolved constituents per unit volume of water remaining after a specified filtering and drying process

Note 1 to entry: TDS is expressed in milligrams per litre.

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## 4 Principle

The test sample is filtered and then dried in a dish to a constant mass in an oven at  $(105 \pm 5) ^\circ\text{C}$ .

## 5 Sample storage and preparation

It is recommended to carry out the test immediately, but not later than one week, after sampling of the water sample or preparation of the eluate.

During storage, the laboratory sample may be subject to changes which are liable to influence the analysis result. If storage is necessary, samples shall be kept at  $2 ^\circ\text{C}$  to  $8 ^\circ\text{C}$ .

## 6 Equipment

- 6.1 Drying system thermostatically controlled and capable of maintaining a temperature of  $(105 \pm 5) ^\circ\text{C}$ ; e.g. drying oven, infrared system.
- 6.2 Desiccator with an active drying agent such as silica gel.
- 6.3 Analytical balance with an accuracy of 1 mg or better.
- 6.4 Membrane filter (porosity of  $0,45 \mu\text{m}$ ).

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**6.5** Filtration apparatus.

**6.6** Evaporation dish or crucible. Temperature tolerant laboratory vessel withstanding 105 °C. Suitable materials are glass, ceramic, porcelain, aluminium and other materials inert to the test portion.

**7 Procedure**

Filter the test sample through the membrane filter as specified in 6.4 unless it has been membrane filtered before (e.g. eluates prepared according to the EN 12457 series).

Dry the dish, for example in the oven, at  $(105 \pm 5)$  °C and weigh to the nearest 1 mg (to obtain  $m_a$ ) after cooling to ambient temperature.

Homogenize and transfer an aliquot ( $V_{FB}$ ), if necessary in stages, into the dish to ensure that not less than 20 mg and not more than 1 000 mg of dry mass,  $m_D$ , remains after evaporation to dryness.

Evaporate the sample to dryness by a drying system according to 6.1 and weigh to the nearest 1 mg (to obtain  $m_b$ ) after cooling to ambient temperature in the desiccator.

The mass of the dry matter,  $m_D$ , shall be considered constant if, after drying for a further half-hour period, the mass obtained does not differ by more than 0,5 % of the previous value or 2 mg whichever is the greater. Otherwise, drying shall be repeated until constant mass has been reached.

If a constant value is not obtained even after drying for a third time, record the value determined last and note this in the test report.

When uncertainty exists about the homogeneity or behaviour of the sample, it is recommended that the analysis is carried out in duplicate.

**8 Calculation of results**

Calculate the total dissolved solids from Formula (1):

$$\rho_{TDS} = \frac{m_D}{V_{FB}} \quad (1)$$

with

$$m_D = m_b - m_a$$

where

$\rho_{TDS}$  is the concentration of total dissolved solids, in mg/l;

$m_D$  is the mass of the dry matter, in mg;

$m_a$  is the mass of the empty dish, in mg;

$m_b$  is the mass of the dish containing the dry matter, in mg;

$V_{FB}$  is the volume of the filtered test sample taken, in l.

Values shall be rounded to e 3 significant figures.

**9 Test report**

The test report shall contain at least the following details:



- a) reference to this draft European Standard;
- b) all data which are necessary to identify the sample;
- c) calculated concentration of total dissolved solids;
- d) details of all procedural steps which deviate from this standard together with all circumstances that may have influenced the results;
- e) type of drying procedure, in case a drying oven is not used.

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## Annex A (informative)

### Performance characteristics

The method performance characteristics given in Table A.1 have been established in a European intercomparison study on two surface water samples, two waste water samples and two eluates, carried out in 2006.

**Table A.1 — Performance characteristics for the determination of total dissolved solids in water and eluates**

Material	$p$	$N$	$O$ %	Mean mg/l	$S_r$ %	$S_R$ %
Surface water A	17	34	0	478	2,15	4,49
Surface water B	17	34	0	3 810	0,39	2,53
Waste water A	17	34	0	27 300	1,34	4,33
Waste water B	17	34	0	4 840	1,28	5,55
Eluate A	17	34	0	4 090	1,74	6,27
Eluate B	17	34	0	3 440	0,71	3,16
<p><math>p</math> is number of participating laboratories</p> <p><math>N</math> is the number of outlier-free individual analytical results</p> <p><math>O</math> is the percentage of outliers</p> <p><math>S_r</math> is the estimate of the relative repeatability standard deviation</p> <p><math>S_R</math> is the estimate of the relative reproducibility standard deviation</p>						