

SLOVENSKI STANDARD
SIST EN ISO 15212-1:2000
01-junij-2000

Denzimetri - oscilacijski tip - 1. del: Laboratorijski instrumenti (ISO 15212-1:1998)

Oscillation-type density meters - Part 1: Laboratory instruments (ISO 15212-1:1998)

Dichtemeßgeräte nach dem Schwingerprinzip - Teil 1: Laborgeräte (ISO 15212-1:1998)

Densimetres a oscillations - Partie 1: Instruments de laboratoire (ISO 15212-1:1998)

Ta slovenski standard je istoveten z: EN ISO 15212-1:1999

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17.060	Merjenje prostornine, mase, gostote, viskoznosti	Measurement of volume, mass, density, viscosity
71.040.20	Laboratorijska posoda in aparati	Laboratory ware and related apparatus

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15212-1

March 1999

ICS 17.060

English version

Oscillation-type density meters - Part 1: Laboratory instruments
(ISO 15212-1:1998)

Densimètres à oscillations - Partie 1: Instruments de
laboratoire (ISO 15212-1:1998)

Dichtemeßgeräte nach dem Schwingerprinzip - Teil 1:
Laborgeräte (ISO 15212-1:1998)

This European Standard was approved by CEN on 3 March 1999.

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.

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

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

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EN ISO 15212-1:1999

Foreword

The text of the International Standard from Technical Committee ISO/TC 48 "Laboratory glassware and related apparatus" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 332 "Laboratory equipment", the secretariat of which is held by DIN.

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 September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

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.

Endorsement notice

The text of the International Standard ISO 15212-1:1998 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Annex ZA (normative)
Normative references to international publications
with their relevant European publications

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 3696	1987	Water for analytical laboratory use - Specification and test methods	EN ISO 3696	1995

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INTERNATIONAL
STANDARD

ISO
15212-1

First edition
1998-10-01

Oscillation-type density meters —

Part 1:
Laboratory instruments

Densimètres à oscillations —

Partie 1: Instruments de laboratoire

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ISO 15212-1:1998(E)

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 15212-1 was prepared by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, Subcommittee SC 4, *Density measuring instruments*.

ISO 15212 consists of the following parts, under the general title *Oscillation-type density meters*:

- *Part 1: Laboratory instruments*
- *Part 2: Process instruments for liquids*

Annexes A and B form an integral part of this part of ISO 15212. Annex C is for information only.

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Oscillation-type density meters —

Part 1: Laboratory instruments

1 Scope

This part of ISO 15212 specifies metrological and other requirements for oscillation-type density meters which are used in laboratories for all kinds of homogeneous fluid samples. In addition, a method for adjustment and calibration of laboratory instruments is given. The instruments are either stand-alone units or part of more complex measuring equipment supplying additional test parameters of the sample.

This part of ISO 15212 does not describe the method of use of density meters for particular applications or products such as petroleum products or beverages. Such methods of use can be defined by relevant institutions such as ISO or responsible government agencies.

This part of ISO 15212 does not define an instrument specification for any particular application. For this information reference should be made to the relevant standard covering the method of use.

This part of ISO 15212 is addressed to manufacturers of density meters and to bodies testing and certifying the conformity of density meters. In addition, this part of ISO 15212 gives recommendations for adjustment and calibration of density meters by the user.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 15212. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 15212 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3585:1998, *Borosilicate glass 3.3 — Properties*.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

IEC 61010-1:1990, *Safety requirements for electrical equipment for measurement, control and laboratory use — Part 1: General requirements*.

IEC 61326-1:1997, *Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements*.

IEC 61326-1:—¹), Amendment 1.

¹) To be published.

3 Definitions

For the purposes of this part of ISO 15212, the following definitions apply.

NOTE The definitions and terms used are in agreement with the "*International Vocabulary of Basic and General Terms in Metrology*".

3.1

adjustment (of a density meter)

operation of bringing the instrument to a state of performance suitable for its use, by setting or adjusting the density instrument constants

NOTE By adjustment, systematic measuring deviations are removed to an extent which is necessary for the provided application. Adjustment demands an intervention which permanently modifies the instrument.

3.2

calibration (of a density meter)

set of operations that establishes the relationship between the reference density of standards and the corresponding density reading of the instrument

NOTE By calibration, no intervention is made which permanently modifies, for example, the instrument constants set during the adjustment procedure.

3.3

parasitic resonant points (of a density meter)

those oscillation frequencies at which the natural frequency of the density sensor is affected by oscillations of the "counter mass", comprising the rest of the instrument

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4 Principle and functional units

4.1 Measuring principle

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The sensors used in density meters are electrically or mechanically induced oscillating systems, whose oscillation frequencies or periods are a function of the sample density. Depending on the sensor design, the sensor can either contain the fluid sample or be immersed in it. Instrument constants of the adjusted density meter are used to calculate the sample density from the oscillation frequency or oscillation period.

4.2 Functional units

Oscillation-type density meters shall consist of the following functional units:

- a) a density sensor capable of either being filled with the sample or of being immersed in it;
- b) a device to excite and control sensor oscillation;
- c) a device to determine and display the density and the oscillation frequency or period;
- d) a device to determine and display the sample temperature for which the measured density is valid;
- e) a system to detect and display malfunctions and operator errors.

The functional units a) to c) are designated as the oscillation system. In addition, oscillation-type density meters can incorporate the following functional units:

- f) a unit for controlling the temperature of the sample and density sensor;
- g) sampling devices;
- h) sensor cleaning devices.

All functional units a) to h) can be integrated into a single instrument or can be separate units.