# SLOVENSKI STANDARD
# SIST EN ISO 182-3:2001

**01-junij-2001**

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**Polimerni materiali - Ugotavljanje tendence zmesi in proizvodov na osnovi homo- in kopolimerov vinilklorida, da pri poviġanih temperaturah sproġļ ajo klorovodik ali druge kisle produkte - 3. del: Konduktometrijska metoda (ISO 182-3:1993)**

Plastics - Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures - Part 3: Conductometric method (ISO 182-3:1993)



Kunststoffe - Bestimmung der Neigung von Formmassen und Erzeugnissen auf der Basis von Vinyl-chlorid-Homopolymeren und -Copolymeren, bei erhöhten Temperaturen Chlorwasserstoff
und andere saure Produkte abzugeben - Teil 3: Leitfähigkeitsverfahren (ISO 182-3:1993)



Plastiques - Détermination de la tendance des compositions a base d'homopolymeres et copolymeres du chlorure de vinyle a dégager du chlorure d'hydrogene et éventuellement d'autres produits acides a températures élevées - Partie 3: Méthode conductimétrique (ISO 182-3:1993)

**Ta slovenski standard je istoveten z:** **EN ISO 182-3:2000**

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**ICS:**

| | | |
|---|---|---|
| 83.080.20 | Plastomeri | Thermoplastic materials |

**SIST EN ISO 182-3:2001** **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 182-3

September 2000

ICS 83.080

English version

# Plastics - Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures - Part 3: Conductometric method (ISO 182-3:1993)

Plastiques - Détermination de la tendance des compositions à base d'homopolymères et copolymères du chlorure de vinyle à dégager du chlorure d'hydrogène et éventuellement d'autres produits acides à températures élevées - Partie 3: Méthode conductimétrique (ISO 182-3:1993)

Kunststoffe - Bestimmung der Neigung von Formmassen und Erzeugnissen auf der Basis von Vinyl-chlorid-Homopolymeren und -Copolymeren, bei erhöhten Temperaturen Chlorwasserstoff und andere saure Produkte abzugeben - Teil 3: Leitfähigkeitsverfahren (ISO 182-3:1993)



This European Standard was approved by CEN on 8 September 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.

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

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



Ref. No. EN ISO 182-3:2000 E

## Foreword

The text of the International Standard from Technical Committee ISO/TC 61 "Plastics" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

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 March 2001, and conflicting national standards shall be withdrawn at the latest by March 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.

### Endorsement notice

The text of the International Standard ISO 182-3:1993 has been approved by CEN as a European Standard without any modification.



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

**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.

| Publication | Year | Title | EN | Year |
|---|---|---|---|---|
| ISO 182-4 | 1993 | Plastics – Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures – Part 4 : Potentiometric method | EN ISO 182-4 | 2000 |

INTERNATIONAL STANDARD

**ISO 182-3**

First edition
1993-04-01

# Plastics — Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures —



## Part 3: Conductometric method



*Plastiques — Détermination de la tendance des compositions à base d'homopolymères et copolymères du chlorure de vinyle à dégager du chlorure d'hydrogène et éventuellement d'autres produits acides à températures élevées —*

*Partie 3: Méthode conductimétrique*

Reference number
ISO 182-3:1993(E)

## 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 182-3 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 6, *Ageing, chemical and environmental resistance*.



Together with the three other parts of ISO 182, it cancels and replaces ISO Recommendation R 182:1970, of which the four parts of ISO 182 constitute a technical revision.

ISO 182 consists of the following parts, under the general title *Plastics — Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures*:

— *Part 1: Congo red method*

— *Part 2: pH method*

— *Part 3: Conductometric method*

— *Part 4: Potentiometric method*

Annexes A, B and C of this part of ISO 182 are for information only.



International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland
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# Plastics — Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures —

# Part 3:
Conductometric method



**WARNING — The use of this part of ISO 182 may involve hazardous materials, operations and equipment. This part of ISO 182 does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this part of ISO 182 to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.**



## 1 Scope

**1.1** This part of ISO 182 specifies a method for the determination of the thermal stability at elevated temperature of compounds and products based on vinyl chloride homopolymers and copolymers (in the following text abbreviated as PVC) which undergo dehydrochlorination (the evolution of hydrogen chloride).

**1.2** The method may be used as a quality control test during manufacture and conversion of PVC compounds. It may also be used for the characterization of PVC compounds and products, especially with regard to the effectiveness of their heat-stabilizing systems.

It is suitable for coloured PVC compounds and products where a discolouration test under the action of heat may be unsatisfactory.

**1.3** The method is recommended for compounded PVC materials and products only, although it can be used for polymers in powder form under appropriate conditions, to be agreed upon between the interested parties. The method is not recommended for PVC compounds in the form of dry blends, since such materials may not be sufficiently homogeneous.

**1.4** PVC compounds and products may evolve other decomposition products, in addition to hydrogen chloride, at elevated temperatures. A limited number of these decomposition products may affect the conductivity of water when they are absorbed into it. Compensation for this effect is not within the scope of this part of ISO 182, and therefore care is necessary in attempting to compare results for dissimilar compounds and products. In this case a method suitable for the determination of chloride ion ($Cl^-$) in the absorbing solution shall be used (see ISO 182-4).

**1.5** The method may also be applied to other plastics materials which can evolve hydrogen chloride or other hydrogen halides when heated under the conditions prescribed by the relevant specifications, or as agreed upon between the interested parties.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 182. 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 182 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 182-4:1993, *Plastics — Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures — Part 4: Potentiometric method.*

ISO 565:1990, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings.*

ISO 4793:1980, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation.*

ISO 6353-2:1983, *Reagents for chemical analysis — Part 2: Specifications — First series.*

## 3 Definition

For the purposes of this part of ISO 182, the following definition applies.

**3.1 stability time,** $t_s$**:** Time, measured by reference to a predetermined change in the conductivity of absorbing demineralized water, required for a certain amount of hydrogen chloride to be evolved when a prescribed mass of PVC compound or product is maintained at an elevated temperature under the test conditions specified in this part of ISO 182.

## 4 Principle

A test portion of the PVC compound or product is maintained at an agreed temperature in a nitrogen gas stream and the hydrogen chloride evolved is absorbed in a given amount of demineralized water. The amount of hydrogen chloride evolved is determined in relation to the recorded change in conductivity of the water.

## 5 Reagents

During the test, use only reagents of recognized analytical grade in accordance with ISO 6353-2.

**5.1 Pure nitrogen**, containing less than 6 ppm oxygen and less than 0,1 ppm carbon dioxide by volume. The purity shall be such that when the gas is passed through demineralized water (see 5.3) for 1 h at a rate of 7,2 l/h ± 0,1 l/h, the conductivity of the water remains unchanged.

The gas shall be dried by passing it through a suitable drying agent, and the flow-rate through the dehydrochlorination cell adjusted by means of a needle valve and measured using a suitable flowmeter.

**5.2 Hydrochloric acid**, aqueous solution, $c$(HCl) = 0,1 mol/l.

**5.3 Demineralized water**, with a pH of 4,0 ± 0,1 and a conductivity not greater than 40 µS/cm, adjusted by the addition of 0,1 mol/l hydrochloric acid.

## 6 Apparatus

The general arrangement of the apparatus is shown in figure 1. The figure shows a re-usable dehydrochlorination cell A. This cell may be replaced by a disposable cell B.

**6.1 Dehydrochlorination cells.**

**6.1.1 Cell A** (re-usable), with shape and dimensions as shown in figure 2.

A recommended procedure for cleaning the cell is given in annex A.



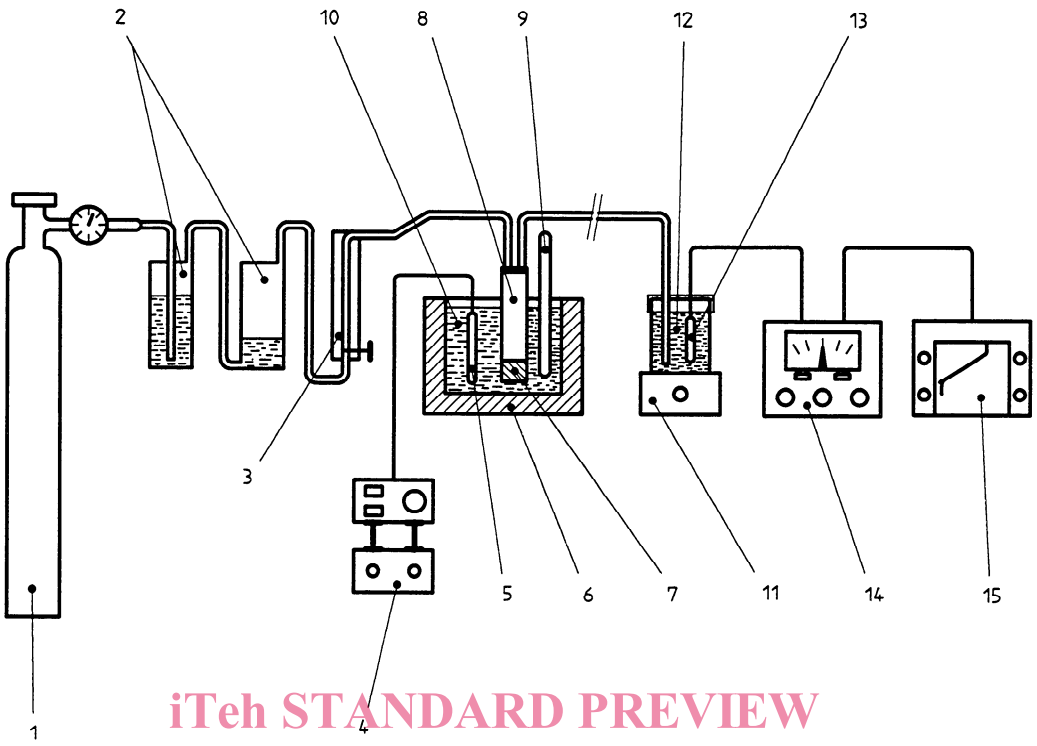
**6.1.2 Cell B** (disposable), with shape and dimensions as shown in figure 3.

NOTE 1 Other types of cell may be employed if it has been proved that the results obtained are equivalent to those obtained with one of the cells described in 6.1.1 and 6.1.2.

**6.2 Test portion holder**, for use with cell A. The test portion is supported on a porous sintered-glass disc (grade P 100, ISO 4793), 10 mm in diameter.

To prevent blocking of the porous disc, it is advisable to place a thin, soft layer of glass wool between it and the test portion.

A recommended procedure for cleaning the disc support is given in annex A.






1 $N_2$ cylinder
2 Purification train
3 Ball flowmeter
4 Electronic temperature controller (scale division 0,1 °C)
5 Temperature sensor
6 Heating bath
7 PVC test portion
8 Dehydrochlorination cell
9 Thermometer (scale division 0,1 °C)
10 Silicone oil
11 Magnetic stirrer
12 Absorbing solution
13 Measuring electrode(s)
14 Conductance meter
15 Recorder



**Figure 1 — General arrangement of apparatus**

Dimensions in millimetres

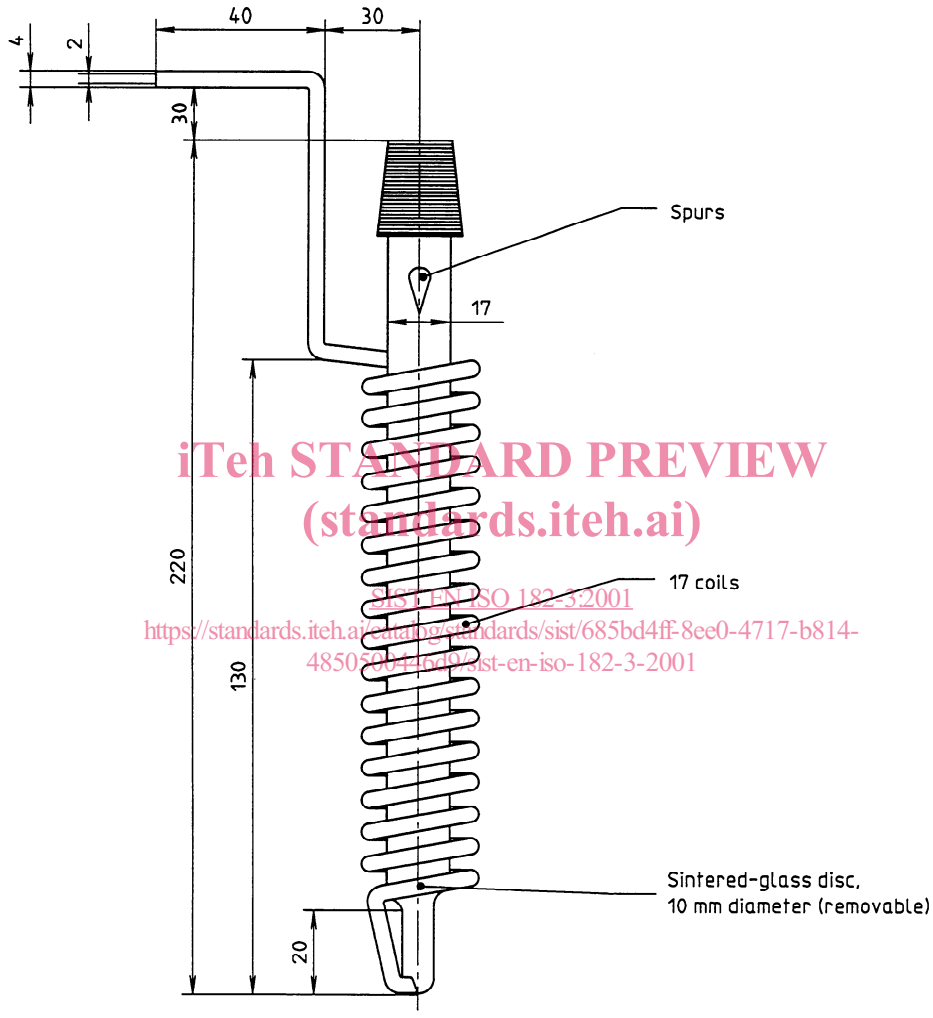





**Figure 2 — Cell A (re-usable) for dehydrochlorination of PVC samples**