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Third edition
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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

Plastiques — Détermination de la tendance des compositions et produits à base d'homopolymères et de 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
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 182-3:2023), of which it constitutes a minor revision.

The changes are as follows:

— the reference to ISO 182-4 in the Scope has been placed in a Note;

— the unit min has been added to *m*, *r*, and *R* in Clause 13;

— the code for stability time in Table 1 has been corrected to t_s;

— the unit of t_s in Table 2 has been corrected to min.

A list of all parts in the ISO 182 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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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 document can involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

1.1 This document 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 This document is applicable to the characterization of PVC compounds and products, especially with regard to the effectiveness of their heat-stabilizing systems.

It is applicable to coloured PVC compounds and products where a discolouration test under the action of heat can be unsatisfactory.

1.3 This document is applicable to compounded PVC materials and products. It can be applicable to polymers in powder form under appropriate conditions, depending on the agreement between the interested parties.

This document does not apply to PVC compounds in the form of dry blends, since such materials might not be sufficiently homogeneous.

1.4 This document does not apply to PVC compounds and products which evolve other decomposition products, in addition to hydrogen chloride, at elevated temperatures that can affect the conductivity of water when they are absorbed into it.

NOTE In this case, ISO 182-4[2] provides the suitable method for the determination of chloride ion (Cl^-) in the absorbing solution.

1.5 This document can 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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 document

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 5.2) for 1 h at a rate of (7,2 ± 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 Demineralized water, with a conductivity not higher than 5 µS/cm.

6 Apparatus

The general arrangement of the apparatus is shown in Figure 1.

6.1 Dehydrochlorination cells.

6.1.1 Glass 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 Glass Cell B (disposable), with shape and dimensions as shown in Figure 3.

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