INTERNATIONAL STANDARD

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# Plastics/rubber — Determination of residual monomers and other organic components by capillary-column gas chromatography —

## Part 1: Direct liquid injection method

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 13741-1:1998), which has been technically revised.

The main changes are as follows:

— the title has been modified to 3 elements from 4 elements;

— part of the Scope (1.3) has been removed;

— Clause 3, Terms and definitions, has been added and subsequent clauses have been renumbered;

— Formulae (1) and (2) have been numbered.

A list of all parts in the ISO 13741-1 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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# Introduction

The requirements imposed today by authorities include the assessment of the content of residual monomers and organic saturated volatiles, for health and environmental reasons sometimes down to minute traces. Former standards for measurement of residual volatiles based on distillation linked with titration cannot cope with such exigences.

This document presents an advanced method for the determination, by gas chromatography, of residual monomers and other organic components in polymer dispersions and lattices. It provides a method that is in line with present-day requirements for analytical methods, and is intended for use instead of ISO 3899, where precise measurements of volatile-matter content are needed, and expands their scope to include other volatile organic components.

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# Plastics/rubber — Determination of residual monomers and other organic components by capillary-column gas chromatography —

## Part 1:
## Direct liquid injection method

**WARNING — This document does not purport to address all of the safety problems, if any, 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 residual monomers and other (saturated) organic components in aqueous polymer dispersions and latices as well as in related products. It makes use of capillary-column gas chromatography with direct injection of the liquid sample.

**1.2** Residual monomers and saturated volatiles that have been successfully determined by this method include acrylic and methacrylic esters, acrylonitrile, butadiene, styrene, vinyl acetate, vinyl chloride as well as by-products such as acetaldehyde and ethylbenzene.

## 2 Normative reference

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.

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

## 3 Terms and definitions

No terms and definitions are listed in this document.

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/

## 4 Principle

A test sample is diluted with water containing an internal standard and injected onto the liner of a gas chromatograph with a capillary column, a flame ionization detector and a linear temperature programming capability.

Butadiene can be co-eluted with cis-2-butene. Butyl acrylate and dibutyl ether shall be separated with DB5 column.

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