INTERNATIONAL STANDARD

ISO 22518

First edition
2019-07

Paints and varnishes — Determination of solvents in water-thinnable coating materials — Gas-chromatographic method

Peintures et vernis — Détermination des solvants dans des peintures diluable à l'eau — Méthode par chromatographie en phase gazeuse

Reference number
ISO 22518:2019(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

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.

Paints and varnishes — Determination of solvents in water-thinnable coating materials — Gas-chromatographic method

1 Scope

This document specifies a method for the gas-chromatographic determination of the solvents in water-thinnable paints and varnishes, binder solutions, emulsions and dispersions.

With the precision stated in Clause 13, single components above 0,02 % (mass fraction) can be determined quantitatively.

The method defined in this document is not applicable for the determination of Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOC) content.

NOTE For the determination of VOC and SVOC, see ISO 11890-2[2].

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.

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 apply.

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

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

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

4 Units

The analytical results are expressed as a percentage mass fraction.

5 Principle

After sample preparation, the components contained in the sample under test are separated by gas chromatography. Either a hot or a cold sample injection system can be used, depending on the product type. After the components have been identified, they are quantified from the peak areas using the internal standard method.

6 Apparatus

6.1 Gas chromatograph

6.1.1 General

The gas chromatograph shall be suitable for use with capillary separation columns and meet the conditions specified in 6.1.2 to 6.1.4.

All of the instrumental parts coming into contact with the test sample shall be made of a material, e.g. glass, which is resistant to the sample and which will not change it chemically.

6.1.2 Sample injection system

6.1.2.1 Hot injection system

The instrument shall have a variable-temperature injection block with a sample splitter. The injection temperature shall be capable of being set to an accuracy of 1 K. The split ratio shall be adjustable and capable of being monitored. The sample splitter insert shall contain silanized glass wool to retain non-volatile constituents. It shall be cleaned and provided with new glass wool packing or replaced as required to rule out errors due to residues of binder or pigment (e.g. adsorption of solvents). The occurrence of adsorption is revealed by peak tailing, in particular with components of low volatility.

6.1.2.2 Cold injection system

The cold injection system shall be provided with temperature programming for heating from room temperature to 300 °C and shall have a sample splitter inlet made of a material such as glass. It shall be provided with a silanized glass wool packing and shall be treated as specified in 6.1.2.1. In this case too, the split ratio shall be adjustable and capable of being monitored.

6.1.2.3 Automatic sample injection system

The precision of the method will be increased if the injection systems, especially the hot injection system, are coupled to an auto injector. The manufacturer's instructions shall be followed when an auto injector is used.

6.1.3 Oven

The oven shall be capable of being heated between 40 °C and 300 °C both isothermally and under programmed temperature control. It shall be possible to set the oven temperature to within 1 K. The final temperature of the temperature program shall not exceed the maximum operating temperature of the separation column (see manufacturer's instructions).

6.1.4 Detector

A Flame Ionization Detector (FID) which is capable of being operated at temperatures up to 300 °C shall be used. To prevent condensation, the detector temperature shall be at least 10 K above the maximum oven temperature. The detector gas supply, injection volume, split ratio and gain setting shall be optimized so that the signals (peak areas) used for the calculation are proportional to the amount of substance

If the separated components are identified by a mass spectrometer, mass-selective detector of Fourier-transform infrared spectrometer (FT-IR spectrometer), these instruments shall be coupled to the gas chromatograph and operated in accordance with the manufacturer's instructions.