

Packaging — Flexible packaging material — Determination of residual solvents by static headspace gas chromatography —

Part 1: Absolute methods

The European Standard EN 13628-1:2002 has the status of a British Standard

ICS 55.040

National foreword

This British Standard is the official English language version of EN 13628-1:2002.

The UK participation in its preparation was entrusted by Technical Committee PKW/5, Primary and transport packaging, to Subcommittee PKW/5/26, Packaging made from flexible materials, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

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Détermination des solvants résiduels par chromatographie
en phase gazeuse et espace de tête statique - Partie 1:
Méthodes absolues

Verpackung - Flexible Packstoffe - Bestimmung der
Restlösemittel durch statische Dampfdruckanalyse mittels
Gaschromatographie - Teil 1: Absolute Verfahren

This European Standard was approved by CEN on 26 August 2002.

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Contents

	page
Foreword	3
1 Scope	4
2 Normative references	4
3 Principle	4
4 Reagents	4
5 Apparatus	5
6 Sampling	8
7 Test specimens	8
8 Incubation of the test specimens	8
9 Procedure	9
10 Precision data.....	16
11 Test report	16

Foreword

This document EN 13628-1:2002 has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This standard is part of a standard for determination of residual solvents by static headspace gas chromatography, which is published in two parts:

- *Part 1: Absolute methods*
- *Part 2: Industrial methods*

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This part of this European Standard specifies methods for the quantitative determination of residual solvents in flexible packaging by static headspace chromatography where the chemical identities of the residual solvents to be determined are known before commencing the analysis. Residues from thermal decomposition products are not within the scope of this standard.

The method is applicable to flexible packaging materials that may consist of mono- or multilayer plastic films, paper or board, foil or combinations thereof.

This method does not apply to residual solvents with amounts lower than 0,5 mg/m².

2 Normative references

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 (including amendments).

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results - Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*.

3 Principle

Specimens of the flexible packaging material are placed in a hermetically closed vial and heated under closely controlled conditions of time and temperature to vaporize solvents into the headspace. The amount of solvent released into the headspace is determined by transferring an aliquot of the headspace into a gas chromatograph for analysis. The transfer may be performed:

- a) by specific semi-automatic or automatic systems which allow pressurization of the heated vials. Quantification is achieved by the multiple headspace extraction (MHE) procedure using external or internal standards;
- b) manually or automatically by using a heated gastight syringe or a loop without pressurization of the heated vials. Quantification is achieved by the standard addition method.

NOTE A prerequisite for a quantitative determination of residual solvents by headspace gas chromatography is that a partition equilibrium for the solvent between the gas phase and the solid phase has been reached before an aliquot of the headspace is withdrawn and transferred into the gas chromatograph.

During the analysis, there may be interferences from possible products of thermal decomposition. Additional peaks due to these products shall not be considered for evaluation of residual solvents.

4 Reagents

4.1 General

All reagents shall be of a recognized analytical reagent grade.

NOTE Grades stated as being suitable for chromatography are commercially available and are recommended for use as reference for standard calibration solutions. Appropriate safety precautions should be used when handling toxic and/or flammable solvents.