
Papir, karton in lepenka, namenjeni neposrednemu stiku z živili – Pogoji za določevanje migracij iz papirja, kartona in lepenke z uporabo spremenjenega polietilen oksida (MPPO) kot modelne raztopine

Paper and board intended to come into contact with foodstuffs - Conditions for determination of migration from paper and board using modified polyphenylene oxide (MPPO) as a simulant

Papier und Pappe vorgesehen für den Kontakt mit Lebensmitteln - Voraussetzungen für die Bestimmung des Übergangs von Papier und Pappe durch die Anwendung von modifizierten Polyphenylenoxiden (MPPO) als ein Simulanz

[SIST EN 14338:2004](https://standards.iteh.ai/catalog/standards/sist/df903d48-8378-4ca5-ae75-b2201a05326a/en-14338:2004)

Papier et carton destinés à être en contact avec des denrées alimentaires - Conditions de détermination de la migration dans les papiers et cartons en utilisant comme solvant simulateur de l'oxyde de polyphénylène modifié (MPPO)

Ta slovenski standard je istoveten z: EN 14338:2003

ICS:

67.250	Materiali in predmeti v stiku z živili	Materials and articles in contact with foodstuffs
85.060	Papir, karton in lepenka	Paper and board

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EUROPEAN STANDARD

EN 14338

NORME EUROPÉENNE

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ICS 67.250

English version

Paper and board intended to come into contact with foodstuffs -
Conditions for determination of migration from paper and board
using modified polyphenylene oxide (MPPO) as a simulant

Papiers et cartons destinés à être en contact avec des denrées alimentaires - Conditions de détermination de la migration des papiers et cartons en utilisant de l'oxyde de polyphénylène modifié (MPPO) comme solvant simulateur

Papier und Pappe vorgesehen für den Kontakt mit Lebensmitteln - Voraussetzungen für die Bestimmung des Übergangs von Papier und Pappe durch die Anwendung von modifizierten Polyphenylenoxiden (MPPO) als ein Simulanz

This European Standard was approved by CEN on 3 November 2003.

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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.

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Foreword

This document (EN 14338:2003) has been prepared by Technical Committee CEN/TC 172 "Paper, board and pulps", the secretariat of which is held by DIN.

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 June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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EN 14338:2003 (E)**1 Scope**

This European Standard specifies a method to assess the transfer or migration of specific volatile and semivolatile substances from paper and board. This test method is developed for paper and board intended to come in contact with dry, non fatty foodstuffs and paper and board for baking purposes. In the last case the modified polyphenylenoxide (MPPO) can be seen as a substitute simulant for fatty contact.

NOTE MPPO can also be seen as a substitute simulant for olive oil.

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).

EN 1186-1:2002, *Materials and articles in contact with foodstuffs — Plastics — Part 1: Guide to the selection of conditions and test methods for overall migration.*

EN 1186-13:2002, *Materials and articles in contact with foodstuffs — Plastics — Part 13: Test method for overall migration at high temperatures.*

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3 Principle

The surface of the article to be tested is covered with modified polyphenylene oxide (Tenax ®¹⁾) and held at the desired time-temperature test conditions where the maximum temperature applicable is 175 °C. The heating takes place in a conventional oven even when the samples are for use in a microwave oven. The exposure is followed by extraction of the adsorbent using an organic solvent depending on the used specific analytical method. In this extract the analysis for the desired components is possible.

¹⁾ Tenax is a trade name of a product supplied by Varian BV, Herculesweg 8, NL-4338 PL Middelburg. This information is given for the convenience of users of this European Standard and does not constitute an endorsement by CEN of the product named. Equivalent products may be used if they can be shown to lead to the same results.

4 Reagents and extraction

4.1 General

All reagents shall be of recognized analytical quality, unless otherwise specified.

4.2 Acetone for chromatography

4.3 Acetonitrile for chromatography

4.4 Diethylether of 99,8 % purity

4.5 Pentane for chromatography

4.6 Methanol for chromatography

4.7 Modified polyphenylene oxide (MPPO), 60 mesh to 80 mesh.

Modified polyphenylene oxide is a polymer with a high molecular weight (comprised between 500 000 dalton to 1 000 000 dalton). It is a porous material, very stable at a high temperature ($T_{\max} = 350\text{ °C}$), a high surface area and a low specific mass ($0,23\text{ g/cm}^3$).

NOTE 1 Gas chromatograms obtained from extracts of new commercial MPPO material has shown that unacceptable high levels of impurities can be present.

NOTE 2 MPPO is also known as Tenax ®.

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4.8 Extraction

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Extraction using acetone is obligatory for complete purification of the MPPO prior to the first use in this test procedure. The extraction is carried as follows:

Place MPPO in a Soxhlet cartridge and extract for 6 h with acetone. Spread the MPPO in a Petri dish of suitable diameter and place the Petri dish in a fumehood. Allow the solvent to evaporate while frequently mixing with a glass rod. Then place the Petri dish in an oven at 160 °C for 6 h. After heating store the MPPO, if not needed immediately, in a closed Erlenmeyer flask.

NOTE 1 MPPO can be used repeatedly if cleaned in this way between uses.

NOTE 2 MPPO is powdery and lightweight and is readily blown about by air currents. When drying MPPO in a forced air oven the dishes should be covered to prevent the MPPO from blowing about.

5 Apparatus

5.1 Cutting implement,

circular knife 1 dm^2 or circular template of diameter 112 mm with a scalpel

5.2 Rule,

graduated in mm, with an accuracy of 0,5 mm

EN 14338:2003 (E)**5.3 Spoon****5.4 Analytical balance,**

capable of determining at least a change of mass of 10 mg

5.5 Oven or incubator,

thermostatically controlled and capable of maintaining the set temperature within the tolerances specified in EN 1186-13:2002, Table B.2.

NOTE In case of an oven with a ventilation system the ventilation rate should be switched to low.

5.6 Glass Petri dishes

with an internal diameter of more than 115 mm for 1 dm² test specimen, shallower than the smaller dish (see 5.7).

5.7 Glass Petri dishes

with an external diameter of 114 mm to cover 1 dm² test specimen.

5.8 Erlenmeyer flasks, iTeh STANDARD PREVIEW
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glass-stoppered, capacity of 300 ml

5.9 Glass filter funnels

without and with frits

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5.10 Volumetric flasks,

capacity of 50 ml

6 Sample preparation

Prepare the test specimen by cutting 1 dm² with the cutting implement (see 5.1).

7 Procedure

Carry out the procedure in duplicate. Place 4 g MPPO evenly in the smaller Petri dish (see 5.7). Cover the Petri dish with the test specimen and close the system with the larger Petri dish (see 5.6). If the two sides of the paper or board are not identical, then the surface intended for food contact should face directly the MPPO. Assemble the Petri dish and then invert the dish to start the test. For the blank determination, take empty Petri dishes and place in it the same mass of MPPO as placed on each test specimen.

NOTE 1 Instead of the Petri dishes it is also possible to use a cell according to EN 1186-13.

NOTE 2 Care should be taken to ensure that an even bed of MPPO covers the test specimen, to an uniform depth.