



SLOVENSKI STANDARD

SIST EN 1186-9:2002

01-september-2002

BUXca Yý U
SIST ENV 1186-9:1997

Materiali in predmeti v stiku z živilni - Polimerni materiali - 9. del: Preskusne metode za celotno migracijo v modelno vodno raztopino, s katero je napolnjen predmet

Materials and articles in contact with foodstuffs - Plastics - Part 9: Test methods for overall migration into aqueous food simulants by article filling

Werkstoffe und Gegenstände in Kontakt mit Lebensmitteln - Kunststoffe - Teil 9: Prüfverfahren für die Gesamtmigration in wässrige Prüflebensmittel durch Füllen des Gegenstandes

Matériaux et objets en contact avec les denrées alimentaires - Matière plastique - Partie 9: Méthodes d'essai pour la migration globale dans les simulants aqueux par remplissage

Ta slovenski standard je istoveten z: EN 1186-9:2002

ICS:

67.250 Materiali in predmeti v stiku z živilni Materials and articles in contact with foodstuffs

SIST EN 1186-9:2002 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 1186-9:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002>

EUROPEAN STANDARD

EN 1186-9

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2002

ICS 67.250

Supersedes ENV 1186-9:1994

English version

Materials and articles in contact with foodstuffs - Plastics - Part 9: Test methods for overall migration into aqueous food simulants by article filling

Matériaux et objets en contact avec les denrées alimentaires - Matière plastique - Partie 9: Méthodes d'essai pour la migration globale dans les liquides simulateurs aqueux par remplissage

Werkstoffe und Gegenstände in Kontakt mit Lebensmitteln - Kunststoffe - Teil 9: Prüfverfahren für die Gesamtmigration in wässrige Prüflebensmittel durch Füllen des Gegenstandes

This European Standard was approved by CEN on 4 January 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword.....	3
1 Scope	5
2 Normative references	5
3 Principle	5
4 Reagents	5
5 Apparatus	6
6 Preparation of test specimens.....	6
7 Procedure	7
8 Expression of results	9
9 Test report	11
Annex A (informative) Precision data.....	12
Annex ZA (informative) Relationship of this European Standard with Council Directive 89/109/EEC and Commission Directive 90/128/EEC and associated Directives.....	13
Bibliography	15

[SIST EN 1186-9:2002](https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002)

<https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002>

Foreword

This document EN 1186-9:2002 has been prepared by Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

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 October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

This document supersedes ENV 1186-9:1994.

This European Standard is one of a series of methods of test for plastics materials and articles in contact with foodstuffs.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative annex ZA, which is an integral part of this document.

At the time of preparation and publication of this standard the European Union legislation relating to plastics materials and articles intended to come into contact with foodstuffs is incomplete. Further Directives and amendments to existing Directives are expected which could change the legislative requirements which this standard supports. It is therefore strongly recommended that users of this standard refer to the latest relevant published Directive(s) before commencement of any of the test or tests described in this standard.

EN 1186-9 should be read in conjunction with EN 1186-1.

Further Parts of this standard have been prepared, and others are in preparation, concerned with the determination of overall migration from plastics materials into food simulants. Their titles are as follows:

EN 1186 Materials and articles in contact with foodstuffs - Plastics –

- | | |
|---------|--|
| Part 1 | Guide to the selection of conditions and test methods for overall migration |
| Part 2 | Test methods for overall migration into olive oil by total immersion |
| Part 3 | Test methods for overall migration into aqueous food simulants by total immersion |
| Part 4 | Test methods for overall migration into olive oil by cell |
| Part 5 | Test methods for overall migration into aqueous food simulants by cell |
| Part | Test methods for overall migration into olive oil using a pouch |
| Part 7 | Test methods for overall migration into aqueous food simulants using a pouch |
| Part 8 | Test methods for overall migration into olive oil by article filling |
| Part 10 | Test methods for overall migration into olive oil (modified method for use in cases where incomplete extraction of olive oil occurs) |
| Part 11 | Test methods for overall migration into mixtures of ¹⁴ C-labelled synthetic triglyceride |
| Part 12 | Test methods for overall migration at low temperatures |

EN 1186-9:2002 (E)

- | | |
|---------|--|
| Part 13 | Test methods for overall migration at high temperatures |
| Part 14 | Test methods for 'substitute tests' for overall migration from plastics intended to come into contact with fatty foodstuffs using test media iso-octane and 95 % ethanol |
| Part 15 | Alternative test methods to migration into fatty food simulants by rapid extraction into iso-octane and/or 95 % ethanol |

Annex A is informative.

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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[SIST EN 1186-9:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002>

1 Scope

This Part of this European Standard specifies test methods for the determination of the overall migration from one surface only of plastics articles in the form of containers, which are intended to come into contact with foodstuffs, into aqueous based food simulants, by filling articles with a selected food simulant at test temperatures up to and including 70 °C for selected test times.

This method is most suitable for plastics in the form of containers and articles that can be filled.

2 Normative references

This European Standard incorporates by dated and 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 and 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 food – Plastics – Part 1: Guide to the selection of conditions and test methods for overall migration.*

ISO 648, *Laboratory glassware - One mark pipettes.*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3 Principle

The overall migration of non-volatile substances from a sample of the plastics is determined as the mass of non-volatile residue after evaporation of the food simulants following filling the test specimen.

The selection of the conditions of test and the food simulant(s) will be determined by the conditions of use as specified in clauses 4, 5 and 6 of EN 1186-1:2002 ([3] and [6]).

Test specimens are filled with the food simulant for the exposure time at temperatures above up to and including 70 °C. At the end of the test period each test specimen is emptied. The food simulant from each test specimen is evaporated to dryness, the mass of the non-volatile residue is determined and expressed as milligrams per square decimetre of surface area exposed to the food simulant.

NOTE In some circumstances the procedure described in this standard can be used for exposure at temperatures above 70 °C.

Overall migration is reported as the mean of three determinations on separate test specimens.

4 Reagents

For details of the preparation and purity of these reagents see clause 4 of EN 1186-1:2002.

- 4.1 Distilled water or water of equivalent quality (simulant A)
- 4.2 Acetic acid 3 % (w/v) in aqueous solution (simulant B)
- 4.3 Ethanol 10 % (v/v) in aqueous solution (simulant C)
- 4.4 Alcoholic simulants for liquids or beverages of an alcoholic strength exceeding 10 % (v/v).

NOTE In the case of materials and articles intended to come into contact with liquids or beverages of an alcoholic strength exceeding 10 % (v/v) the test can be carried out with aqueous solutions of ethanol of a similar strength.

EN 1186-9:2002 (E)**5 Apparatus**

- 5.1 Analytical balance capable of determining a change in mass of 0,1 mg.
- 5.2 Lint-free cloth or soft brush.
- 5.3 Beaker, 2 l.
- 5.4 Glass beads, 2 mm to 3 mm diameter.
- 5.5 Thermostatically controlled oven or incubator or refrigerator capable of maintaining the set temperature within the tolerances specified in Table B.2 of EN 1186-1:2002.
- 5.6 Dishes, stainless steel, nickel, platinum, platinum alloy, gold 50 mm to 90 mm diameter and maximum mass 100 g, for evaporation of food simulants and weighing of residues. Glass, glass ceramic or ceramic dishes may be used, provided that the surface characteristics are such that the masses of the dishes after evaporation of any specified food simulants followed by conditioning in the desiccator used, achieves a constancy of $\pm 0,5$ mg. Stainless steel and nickel dishes are suitable only for distilled water and ethanol solutions. Glass, glass ceramic, glazed ceramic, platinum, platinum alloy or gold dishes are suitable for all three simulants.
- 5.7 Steam bath, hot plate, distillation apparatus or rotary evaporator for evaporation of food simulant at the end of test period.
- 5.8 Desiccator with anhydrous calcium chloride or self indicating silica gel.
- 5.9 Beakers, 250 ml.
- 5.10 Pipette, 200 ml, complying with the minimum requirements of ISO 648.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 1186-9:2002](https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002)

6 Preparation of test specimens**6.1 General**

It is essential that test specimens are clean and free from surface contamination (many plastics can readily attract dust due to static charges). Before preparing test specimens, remove any surface contamination from the sample by gently wiping it with a lint free cloth, or by brushing with a soft brush. Under no circumstances wash the sample with water or solvent. If it is specified in the instructions for use of the article that it should be washed or cleaned before use see 8.1 of EN 1186-1:2002. Minimize handling of the samples and, where necessary, wear cotton gloves.

6.2 Number of test specimens**6.2.1 Volume of articles**

Determine and record the volume of food simulant required to fill an article to its nominal foodstuff volume. If the nominal volume of foodstuff to fill the article is not known, determine the surface area that will be in contact with the food simulant when filled to 5 mm from the top of the test specimen.

6.2.2 Articles with a nominal volume of more than 200 ml

Five articles are required to provide five test specimens. These test specimens are utilized as follows:

- a) three test specimens for the migration test;
- b) two test specimens for the determination of surface area.

6.2.3 Articles with a nominal volume of less than 200 ml

The number of articles required to provide a test specimen is dependent on their volume. A test specimen shall be made up of sufficient articles to contain a minimum of 200 ml of the food simulant.

Five test specimens are required. These test specimens are utilized as follows:

- a) three test specimens for the migration test;
- b) two test specimens for the determination of surface area.

Record the number of articles used to provide the test specimen.

6.3 Surface area of test specimen exposed to food simulant

Determine and record the surface area of the test specimen which is intended to come into contact with its nominal volume of foodstuff. If the nominal volume of foodstuff to fill the article is not known, determine the surface area which will be in contact with the food simulant when filled to 5 mm from the top of the test specimen.

NOTE 1 For some articles it is recognized that it is impractical to measure the surface area intended to come into contact with foodstuff. For such articles the overall migration is measured as milligrams of substance released per kilogram of food simulant.

NOTE 2 In the case of articles with a volume of less than 200 ml this will be the surface area of one article multiplied by the number of articles used to provide a test specimen.

6.4 Articles with a capacity of not less than 500 ml and not more than 10 l

It is not necessary to determine the volume of these articles since the migration is expressed in mg/kg of food simulant.

<https://standards.iteh.ai/catalog/standards/sist/bcd4ba6a-8d48-4b36-8050-5ec5af0572b0/sist-en-1186-9-2002>

7 Procedure

7.1 Exposure to food simulant

Mark each test specimen for identification, and where more than one article has been used for a test specimen, also mark individually.

Place, in a beaker, a sufficient volume of the food simulant to fill the three test specimens to the nominal volume, if known, or to 5 mm from the top and to provide two 200 ml blanks. Insert a thermometer or thermocouple, if applicable see NOTE 3, in the simulant. Place the beaker in the thermostatically controlled oven or incubator or refrigerator set at the test temperature and leave until the simulant has attained the test temperature.

Remove the beaker containing the food simulant from the thermostatically controlled oven or incubator or refrigerator. Fill the three test specimens with simulant to the nominal volume of the article or to 0,5 cm from the top. If the container has a specified nominal volume of contents see 8.2 of EN 1186-1:2002. Insert the thermometer or thermocouple in one of the test specimens containing simulant, if applicable see NOTE 3. Cover the test specimens and the remaining simulant with an inert material to prevent evaporation. This part of the operation should be carried out in the minimum time to prevent undue heat loss from the simulant.

Place the test specimens and food simulant in the thermostatically controlled oven or incubator or refrigerator set at the test temperature. Observe the temperature and leave the test specimens and food simulant for the selected period of time after the temperature of the simulant has reached a temperature within the permitted tolerance for temperature, see Tables B.1 and B.2 of EN 1186-1:2002 for permitted tolerances on test times and temperature.

NOTE 1 Where the surface of simulant is large, a check should be made to ensure that excessive loss of simulant by evaporation does not occur.