SLOVENSKI STANDARD

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Papir, karton in lepenka, namenjeni neposrednemu stiku z živili - Ugotavljanje obstojnosti barve v obarvanem papirju, kartonu in lepenki

Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board

Papier und Pappe vorgesehen für den Kontakt mit Lebensmitteln - Bestimmung der Farbechtheit von gefärbtem Papier und Pappe

Papiers et cartons destinés a entrer en contact avec les denrées alimentaires - Détermination de la solidité de la couleur des papiers et cartons colorés

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English Version

Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board

Papiers et cartons destinés à entrer en contact avec les denrées alimentaires - Détermination de la solidité de la couleur des papiers et cartons colorés

Papier und Pappe vorgesehen für den Kontakt mit Lebensmitteln - Bestimmung der Farbechtheit von gefärbtem Papier und Pappe

This European Standard was approved by CEN on 28 March 2006.

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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 646:2006) has been prepared by Technical Committee CEN/TC 172 “Pulp, paper and board”, 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of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

This document supersedes EN 646:2000.

With regard to EN 646:2000 the following changes have been made:

a) the test fluid "sodium carbonate solution" has been omitted and the test fluid "saliva simulant" has been introduced to cover a demand;

b) editorial changes.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document describes procedures for the testing of dyed paper and board intended to come into contact with foodstuffs. Two procedures are given. Procedure A for contact of long duration (e. g. food packaging) and procedure B for contact of short duration (e. g. napkins, kitchen papers, household papers).

Visual evaluation against a blank is used only in order to detect any bleeding (yes/no) while evaluation against a grey scale provides grading of the bleeding.

2 Normative references

The following referenced documents are indispensable for the application 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 8787, *Paper and board — Determination of capillary rise — Klemm method*

3 Terms and definitions

For the purposes of this document, the following term and definition applies.

colour fastness
lack of transfer of colour from a paper to a non stained glass-fibre paper, saturated with a test fluid and evaluated visually for staining against a grey scale or a blank

4 Principle

A sample is brought into contact with glass fibre papers which have been saturated with a test fluid and placed under load for a given time. The staining of the glass fibre paper is evaluated with the grey scale. The staining of the glass fibre paper is evaluated against a blank or grey scale. The test fluids used are distilled or deionised water, dilute acetic acid, saliva simulant and olive oil depending on the type of contact expected.

5 Materials and equipment

5.1 Unstained glass fibre papers of 60 mm × 90 mm. The glass fibre papers shall meet the following conditions:

a) grammage 70 g/m²;

b) capillary rise of 190 mm to 210 mm in 10 min in accordance with ISO 8787;

c) free from fluorescent whitened and wet strength agents;

d) free from cellulosic fibres.

5.2 Glass plates, 60 mm × 90 mm.

5.3 Polyethylene film, uncoloured and transparent.

5.4 Mass, 1 kg.

5.5 Grey scale in accordance with EN 20105 A03. This is only needed when grading is required.

6 Reagents

6.1 Distilled or deionised water

6.2 Aqueous acetic acid 3,0 % (m/v)

6.3 Saliva simulant 5 g/l

6.3.1 Composition of the simulated saliva with a pH of 6.8 ± 0.1

Reagents	Mass fraction g/l
Magnesium chloride ($MgCl_2 \cdot 6H_2O$)	0.17
Calcium chloride ($CaCl_2 \cdot 2H_2O$)	0.15
Dipotassium hydrogen phosphate ($K_2HPO_4 \cdot 2H_2O$)	0.76
Potassium carbonate (K_2CO_3)	0.53
Sodium chloride (NaCl)	0.33
Potassium chloride (KCl)	0.75
Hydrochloric acid (1%, mass fraction)	Added until pH value equals 6.8 ± 0.1

6.3.2 Production of simulated saliva

Dissolve the potassium and sodium salts in approx. 900 ml water. Then add the calcium chloride and magnesium chloride and stir until all added reagents have dissolved completely. Calibrate the pH meter with a buffer solution as stipulated by the manufacturer. Then immerse the pH electrode into the solution, stir briefly and add hydrochloric acid until a constant pH of 6.8 ± 0.1 has been obtained. Transfer the solution to a 1000 ml volumetric flask and fill to the mark with water. Store protected from light and make sure that the pH of the simulated saliva is in the 6.8 ± 0.1 range prior to use.

NOTE If the simulated saliva is to be kept longer than 2 weeks, it is advisable to use water that has been boiled for 10 minutes.

6.4 Iso-octane (2,2,4-trimethylpentan)

6.5 Rectified olive oil, characterized as follows:

— iodine value (Wijs)	80 to 88
— refractive index at 25 °C	1,4665 to 1,4679
— acidity (expressed as % oleic acid)	max. 0,5 %
— peroxide number (expressed as oxygen milli-equivalents per kg oil)	max. 10

7 Sampling

If a lot is tested then sampling is carried out in accordance with EN ISO 186.

8 Preparation of sample

Cut or punch several test pieces of 50 mm × 20 mm from the sample under investigation. Smooth edges shall be obtained.

9 Procedure A (long duration contact)

9.1 Immerse two sheets of unstained glass fibre paper (5.1) in a test fluid (6.1, 6.2, 6.3, 6.4 or 6.5). Remove the sheets after saturation and free the sheets from excess fluid by wiping on the rim of the container.

9.2 Place one sheet of unstained glass fibre paper with its smooth side upwards on the glass plate (5.2). Place the test piece (Clause 8) immediately on the unstained glass fibre paper. Cover it with the second saturated sheet of unstained glass fibre paper, so that the smooth side of the unstained glass fibre paper is in contact with the test piece again. Place a second glass plate (5.2) on top of the second unstained glass fibre paper and wrap the total assembly in polyethylene film (5.3) to prevent the edges from drying out, load it with a mass of 1 kg (5.4) and allow it to stand for 24 h at (23 ± 2) °C with protection against direct light penetration.

9.3 If test pieces of a grammage of > 140 g/m² are to be investigated, an appropriate even number of unstained glass fibre paper layers (5.1) is used so that the total of their grammages just exceeds the grammage of the test piece.

Construct the assembly as described in 9.2, with each unstained glass fibre paper being individually saturated and wiped, and arranged in such a way that the same number of unstained glass fibre papers are in contact with both sides of the test piece.

9.4 After 24 h open the assembly. Place the unstained glass fibre papers on 3 adjacent glass rods, Ø 8 mm to Ø 10 mm, with the side which was in contact with the test piece upwards, cover them without contact to prevent light penetration and air-dry at ambient temperature. Unstained glass fibre papers saturated with olive oil are not dried.

10 Procedure B (short time contact)

10.1 Immerse two sheets of unstained glass fibre paper (5.1) in a test fluid (6.1, 6.2, 6.3, 6.4 or 6.5). Remove the sheets after saturation and free the sheets from excess fluid by wiping on the rim of the container.

10.2 Place one sheet of unstained glass fibre paper with its smooth side upwards on the glass plate (5.2). Place the test piece (Clause 8) immediately on the unstained glass fibre paper. Cover it with the second saturated sheet of unstained glass fibre paper, so that the smooth side of the unstained glass fibre paper is in contact with the test piece again. Place a second glass plate (5.2) on top of the second unstained glass fibre paper and wrap the total assembly in polyethylene film (5.3) to prevent the edges from drying out, load it with a mass of 1 kg (5.4) and allow it to stand for 10 min at (23 ± 2) °C with protection against direct light penetration.

10.3 After 10 min open the assembly. Place the unstained glass fibre papers on three adjacent glass rods, Ø 8 mm to Ø 10 mm, with the side which was in contact with the test piece upwards, cover them without contact to prevent light penetration and air-dry at ambient temperature. Unstained glass fibre papers saturated with olive oil are not dried.

11 Evaluation

Evaluate the staining of the glass fibre papers on the side with which they were in contact with the sample, using a blank or the grey scale (5.5). If grading is required use the grey scale in accordance with EN 20103 A03. When several layers of unstained glass fibre papers are used, evaluate only the layer that was in contact with the test piece. If the two sides of the sample produce different results, the test report shall state to which side of the sample the data relates.

If the evaluation is done against a blank in order to detect any bleeding, the result is given as "yes" or "no". If a grading is provided a distinction is drawn between five different evaluation grades: Grade one signifies poor fastness; grade five signifies good fastness. The grade of the grey scale which is the most similar to the stained glass fibre paper is given as the evaluation grade of the tested paper.

NOTE 1 In the case that paper or board is coming into contact with foodstuffs only with one side (e. g. food packaging) and it is known which side is facing the food, only this side will be evaluated.

NOTE 2 As iso-octane is more severe than olive oil it is possible to show compliance using olive oil, if the test fails with iso-octane.

12 Report

The test report shall include the following information:

a) Reference to this European Standard;

b) test result;

c) designation of the paper or board and identification of the sample tested; side tested if applicable;

d) procedure A or B; evaluation yes/no or grading;

e) test fluids and associated evaluation notes;

f) date of test;

g) any deviation from this European Standard.