SLOVENSKI STANDARD
SIST EN 648:2019

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Nadomešča:
SIST EN 648:2007

Papir, karton in lepenka, namenjeni za stik z živili - Ugotavljanje svetlobne obstojnosti papirja, kartona in lepenke, ki vsebujejo optična belila

Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board

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

Papier et carton destinés à entrer en contact avec les denrées alimentaires - Détermination de la solidité du papier et du carton blanchis par des agents d'azurage fluorescents

Ta slovenski standard je istoveten z: **EN 648:2018**

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

SIST EN 648:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 648

November 2018

ICS 67.250; 85.060

Supersedes EN 648:2006

English Version

Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board

Papier et carton destinés à entrer en contact avec les denrées alimentaires - Détermination de la solidité du papier et du carton blanchis par des agents d'azurage fluorescents

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

This European Standard was approved by CEN on 22 July 2018.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 648:2018) 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of an identical text or by endorsement, at the latest by May 2019, and conflicting national standards shall be withdrawn at the latest by May 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 648:2006.

With regard to EN 648:2006 the following changes have been made:

a) Clause 1 “Scope” has been revised and extended;

b) in Clause 6 “Reagents” the test fluid “saliva simulant ” has been removed and the test fluid “alkaline salt solution” has been introduced;

c) new test conditions, matching the use of the tested papers and boards;

d) new definition for the glass fibre paper;

e) editorial changes.

Attention shall be drawn to the fact that the glass fibre papers have not been duly validated before the publication of this standard.

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

1 Scope

This document describes procedures for the testing of the fastness of fluorescent whitened paper and board intended to come into contact with foodstuffs. Some procedures depending on the foreseeable use of the material are given.

Visual absence of the glass fibre paper's fluorescence under UV light is evaluated.

For samples having significant different sides, a migration can occur from one glass fibre to the other and could lead to wrong interpretation of the fastness of one side. It is advisable to check these samples using large sampling procedure to prevent cross contamination of the glass fibre during the migration procedure. The procedure is described in Annex A. If lower limit of detection is required, this procedure can also be used.

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.

EN ISO 186, *Paper and board - Sampling to determine average quality (ISO 186)*

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

ISO 6588-2, *Paper, board and pulps - Determination of pH of aqueous extracts - Part 2: Hot extraction*

3 Terms and definitions

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

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
fastness
ineffective transfer of fluorescent whitening agent from paper, to a glass fibre paper saturated with a test fluid and evaluated visually under UV-light against a series of comparison papers

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 by comparison with a series of fluorescent whitened comparison papers. The test fluids used are distilled or deionized water, dilute acetic acid, alkaline salt solution and olive oil depending on the type of food contact expected.

5 Materials and equipment

5.1 Unstained glass fibre papers[1] of 60 mm × 90 mm. The glass fibre papers shall meet the following conditions:

a) grammage 70 g/m^2;

b) pH-value 9,0 to 9,5, measured in the hot water extract according to ISO 6588-2;

c) free from fluorescent whitened and wet strength agents;

d) free from cellulosic fibres.

5.2 Glass fibre papers with a diameter of 30 mm. The glass fibre papers shall meet the same conditions as in 5.1.

5.3 Watch glass dish with a diameter of 40 mm.

5.4 Glass plates, 60 mm × 90 mm.

5.5 Polyethylene film, uncoloured and transparent.

5.6 Weight having a mass of 1 kg.

5.7 UV lamp giving UV-A (365 nm).

5.8 Drying cupboard.

5.9 Kettle.

6 Reagents

6.1 Fluorescent whitening agent; Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[[4-[bis(2-hydroxyethyl)amino]-6-(phenylamino)-1,3,5-triazin-2-yl]amino]-, disodium salt, CAS: 4193-55-9; an aqueous solution of this whitening agent shall exhibit the following absorbency.

Absorbency:	(0,350 ± 0,01) or (0,420 ± 0,01)
Wavelength:	365 nm resp. 350 nm
Path length:	1 cm
Test solution:	10 mg FWAs (Fluorescent whitening agents) in 1 l water (6.2)

Measurement against water (6.2).

Deviation of this absorbency makes adjustment of the amount of fluorescent whitening agent used in 11.1 necessary. The correction shall be made in line with the absorbency found.

6.2 Distilled or deionized water, purity in accordance to EN ISO 3696, grade 3.

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[1] A source for examples of glass fibre papers can be obtained at DIN Standards Committee Paper, board and pulps (NPa) [npa@din.de]; http://www.din.de/en/getting-involved/standards-committees/npa.

6.3 Aqueous acetic acid, 3 % (m/v).

6.4 Alkaline salt solution, see Table 1, composition of the alkaline salt with a pH of 8,6 ± 0,1.

Table 1 — Composition of alkaline salt solution

Chemical	Mass fraction g/l
Sodium hydrogen carbonate ($NaHCO_3$)	4,2
Sodium chloride (NaCl)	0,5
Potassium carbonate (K_2CO_3)	0,2

6.5 Vegetable oil, that should be as defined in Commission Regulation (EU) No 10/2011.

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

9.1 In case of test conditions D, the glass plates (5.4), the weight (5.6) and the alkaline salt solution (6.4) are stored for 1 h at testing temperature in a drying cupboard (5.8); fluorescent whitening agent (6.1) is boiled in kettle (5.9). The use of cotton gloves is sufficient.

9.2 Immerse two sheets of unstained glass fibre paper (5.1) in a test fluid (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.

9.3 Place one sheet of unstained glass fibre paper with its smooth side upwards on the glass plate (5.4). 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 (5.4) on top of the second unstained glass fibre paper and for procedures A and B wrap the total assembly in polyethylene film (5.5) to prevent the edges from drying out, load it with a mass of 1 kg (5.6) and allow it to stand under the condition of Table 2 with protection against direct light penetration.

9.4 If test pieces of a grammage of > 140 g/m^2 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.

9.5 After the storage time 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 Test conditions

Table 2 describes the test conditions of EN 648.

Table 2 — Test conditions of EN 648

Procedures A – D	Simulation of the contact
Procedure A 24 h at (23 ± 2) °C	long duration contact
Procedure B 4 h at (23 ± 2) °C	medium time contact
Procedure C 10 min at (23 ± 2) °C	short time contact
Procedure D 30 min at (120 ± 3) °C in oil 30 min at (90 ± 3) °C in water	hot contact fatty food moist food

Test conditions A also covers test conditions B and C and long-time duration of hot contact is covered by A and D.

11 Comparison papers

11.1 Solutions for comparison papers

Prepare the following stock solution (1 000 mg/l).

Dissolve 1 g of fluorescent whitening agent (6.1) in 800 ml distilled or deionized water (6.2) and make up to 1 l. Using this stock solution, prepare the following standard concentrations.

Table 3 — Standard concentrations for stock solutions, FWA (fluorescent whitening agent)

Evaluation grade	FWA-solution	FWA mg/l
1	125 ml stock solution diluted to 1 l	125
2	31 ml stock solution diluted to 1 l	31
3	8 ml stock solution diluted to 1 l	8
4	3 ml stock solution diluted to 1 l	3
5	blank with distilled water	0

The stock solutions and the dilutions shall always be freshly prepared.

11.2 Preparation of fluorescent whitened comparison papers

Glass fibre papers (5.1 and 5.2) are used as comparison papers and are treated as follows:

Cut out round samples with a diameter of 30 mm from the glass fibre paper. Apply 100 µl standard liquid of the defined concentration on a watch glass dish with a diameter of 40 mm (5.3). Put the round sample of the glass fibre paper on the watch glass dish with the standard liquid and distribute the standard liquid equally into the glass fibre paper (e.g. using a stamp). Put the accordingly prepared round sample on the normal glass fibre paper of 90 mm × 60 mm. Air dry the accordingly prepared