BRITISH STANDARD

BS EN
12702:2000

Adhesives for paper and board, packaging and disposable sanitary products — Determination of blocking behaviour of potentially adhesive layers

The European Standard EN 12702:2000 has the status of a British Standard

ICS 83.180

National foreword

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The UK participation in its preparation was entrusted to Technical Committee PRI/52, Adhesives, which has the responsibility to:

— aid enquirers to understand the text;

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— monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 4, an inside back cover and a back cover.

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English version

Adhesives for paper and board, packaging and disposable sanitary products — Determination of blocking behaviour of potentially adhesive layers

Adhésifs pour papier et carton, emballage et produits sanitaires jetables — Détermination du comportement au blocage de couches potentiellement adhésives

Klebstoffe für Papier, Verpackung und Hygieneprodukte — Bestimmung des Blockverhaltens von klebfähigen Schichten

This European Standard was approved by CEN on 15 November 1999.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN 12702:2000 E

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 193, Adhesives, the Secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

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

Contents

1 Scope

This European Standard specifies a method for the determination of blocking behaviour of thermoplastic or hygroscopic layers or coatings of potentially adhesive surfaces.

Some potentially adhesive surfaces are both thermoplastic and hygroscopic. The method described provides a means for determining, on the same surface, both thermoplastic and hygroscopic blocking.

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.

EN 923, *Adhesives — Terms and definitions.*

EN 1066, *Adhesives — Sampling.*

EN 1067, *Adhesives — Examination and preparation of samples for testing.*

3 Terms and definitions

For the purposes of this standard the following definitions, together with those given in EN 923, apply.

3.1

potentially adhesive surface

surface in substantially non-adhesive state which may be activated to an adhesive state by heating, application of pressure or organic/aqueous based solvents

3.2

blocking

adhesion between contacting surfaces of similar or dissimilar material, occurring during storage under the influence of time, pressure and temperature (thermoplastic blocking) or humidity (hygroscopic blocking)

3.3

cohesive blocking

blocking of two identical, potentially adhesive surfaces

3.4

adhesive blocking

blocking of a potentially adhesive surface against another surface

3.5

first degree blocking

adhesion between surfaces under test to such a degree that when the upper specimen is lifted, the lower specimen will cling to it but may be parted easily with no evidence of damage to either surface

3.6

second degree blocking

adhesion of such a degree that when surfaces under test are parted one surface will be damaged

3.7

critical temperature

lowest temperature at which blocking of a given degree occurs

3.8

critical humidity

lowest humidity at which blocking of a given degree occurs

4 Principle

Test specimens are placed face to face between glass plates. The degree and type of blocking are determined.

5 Safety

Persons using this standard shall be familiar with normal laboratory practice.

This standard does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European or national regulatory conditions.

6 Apparatus and materials

6.1 *Oven*, capable of maintaining temperatures up to within 85 °C ± 2 °C, and of sufficient size to hold one or more desiccators of the type described in **6.2**.

Alternatively, a controlled humidity oven may be used.

6.2 *Desiccators*, to be used as humidity chambers, with a minimum internal diameter of 150 mm. The desiccators shall be made of glass, with ground flanges and fitting covers. Ground edges should be clean and well lubricated with stopcock grease.

6.3 *Salts*, for maintaining constant humidity conditions within the desiccators, as follows:

a) *Anhydrous calcium chloride ($CaCl_2$)*, for low humidity.

b) *Salts, as given in Table 1*, employed in saturated solution.

Table 1 — Salts and relative humidity

Salt	Relative humidity over saturated solution at 38 °C, approximately %
Sodium dichromate	50
Sodium bromide	54
Sodium nitrate	62
Sodium acetate	68
Sodium chloride	75
Potassium chloride	83
Ammonium monophosphate	91

NOTE A desiccator containing salt solution should be prepared and held at the designated temperature a sufficient time in advance of use to ensure humidity equilibrium within the desiccator. An excess of undissolved salt should be maintained throughout the period of testing.

6.4 *Weights of 0,5 Kg*, with a flat base.

6.5 *Glass plates*, 40 mm by 40 mm and approximately 6 mm in thickness.

6.6 *Filter paper*, general usage, cut into 50 mm by 50 mm squares.

NOTE In cases where filter paper is deemed inadequate, a different paper, or material other than paper, can be used by agreement.

7 Test specimens

7.1 Take the specimens from the material to be tested in accordance with EN 1066. Examine and prepare those specimens for testing in accordance with EN 1067.

7.2 Prepare the test specimens to conform closely with relevant commercial practice with respect to adhesive thickness, substrate and method of preparation.

7.3 Cut eighteen test specimens 60 mm × 60 mm from suitable large specimens for each series of tests (six specimens for cohesive blocking tests and three specimens for adhesive blocking tests in both thermoplastic and hygroscopic blocking).

8 Conditioning

8.1 Condition the test specimens and filter paper for determining thermoplastic blocking in a desiccator over anhydrous calcium chloride at (38 ± 1) °C for 24 h.

8.2 Condition the test specimens and filter paper for determining hygroscopic blocking in a desiccator over the appropriate saturated salt solution at the humidity required at (38 ± 1) °C for 24 h.

9 Procedure

9.1 General

For cohesive blocking, place three sets of two conditioned test specimens, edges aligned, adhesive face to adhesive face, on a glass plate (**6.5**).

For adhesive blocking, prepare three sets of filter paper (**6.6**) superimposed on the adhesive face of conditioned test specimen and place them on a glass plate. Place a second glass plate on top and align the edges so that two edges of the test specimens are flush with the two edges of the glass plates.

9.2 Thermoplastic blocking

Immediately place the test assemblies, with a 0,5 kg weight (**6.4**) on top and in the centre of the glass plate, in a desiccator (**6.2**) over anhydrous calcium chloride [**6.3** a)] maintained at (38 ± 2) °C for 24 h in the oven (**6.1**).

9.3 Hygroscopic blocking

Place the test assemblies, with a 0,5 kg weight on top and in the centre of the glass plate, in a desiccator maintained at approximately 50 % relative humidity and at (38 ± 2) °C for 24 h in the oven (**6.1**).

9.4 Remove the test assemblies, allow to cool to room temperature, and examine promptly by manual separation of the layers, noting the degree of adhesion.

Classify the thermoplastic or hygroscopic blocking as follows:

1) no blocking;
2) first degree of blocking;
3) second degree of blocking; or
4) any other degree of blocking as agreed upon.

9.5 If the classification is “no blocking”, repeat the test with new specimens at successively higher temperatures (increments of 5 °C starting at 45 °C up to a maximum of 85 °C ± 2 °C) for thermoplastic blocking, or successively higher humidities (increments shown for the salts in Table 1 at 38 °C) for hygroscopic blocking until first or second or other degree of blocking is found, or until a suitable high temperature or humidity is reached.

10 Test report

The test report shall include:

a) complete identification of the adhesive layer tested, including thickness or weight per unit area, and method of application to the substrate, if any;
b) any alternative to filter paper employed in **6.6**;
c) type of blocking determined (see **9.1** or **9.2**);
d) class of blocking (see **9.4**);
e) results of all determinations made, including:
— for thermoplastic blocking, the critical temperature or the highest temperature employed;
— for hygroscopic blocking, the critical humidity or the highest humidity employed;
— any other critical phenomena;
f) date of test.

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