



BSI Standards Publication

Adhesives for paper and board, packaging and disposable sanitary products — Determination of low temperature flexibility or cold crack temperature

National foreword

This British Standard is the UK implementation of EN 12703:2016. It supersedes BS EN 12703:2012 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/52, Adhesives.

A list of organizations represented on this committee can be obtained on request to its secretary.

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NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2016

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English Version

Adhesives for paper and board, packaging and disposable sanitary products - Determination of low temperature flexibility or cold crack temperature

Adhésifs pour papier, carton, emballage et produits sanitaires jetables - Détermination de la flexibilité à basse température ou de la température de fissuration à froid

Klebstoffe für Papier, Verpackung und Hygieneprodukte - Bestimmung des Kaltbruchverhaltens oder der Kaltbruchtemperatur

This European Standard was approved by CEN on 6 May 2016.

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European foreword

This document (EN 12703:2016) 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of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

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Introduction

SAFETY STATEMENT — Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

ENVIRONMENTAL STATEMENT — It is understood that some of the material permitted in this standard may have negative environmental impact. As technological advantages lead to acceptable alternatives for these materials, they will be eliminated from this standard to the extent possible.

At the end of the test, the user of the standard should take care to carry out an appropriate disposal of the wastes, according to local regulation.

1 Scope

This European Standard specifies a method to determine whether a film of adhesive of given dimensions will craze, crack or fracture at a specified temperature.

Alternatively, the temperature at which the film will craze, crack or fracture can be determined.

The method described can be used as a quality control test, or to compare the flexibility of adhesives at low temperatures.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 923, *Adhesives - Terms and definitions*

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

EN ISO 15605, *Adhesives - Sampling (ISO 15605:2000)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923 apply.

4 Principle

An unsupported film of the adhesive, after conditioning, is bent through 180° over specified diameter cylindrical mandrel.

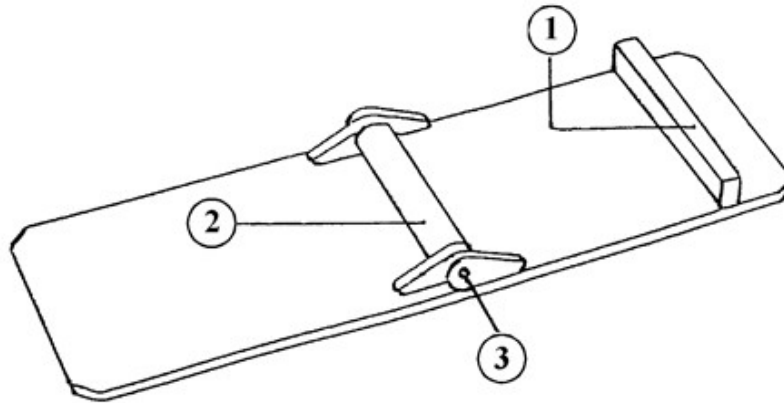
The test piece is then examined for signs of fracture, crazing or cracking.

The test may be carried out either as a pass/fail test or at successively lower temperatures until a failure occurs.

5 Apparatus

Specimens shall be conditioned for 24 h at 23 °C and 50 % RH.

5.1 Bend test apparatus, as shown in Figure 1. The mandrel shall be made of rigid and suitably corrosion-resistant material, e.g. stainless steel.



Key

- 1 stop of identical height to mandrel
- 2 mandrel
- 3 mandrel pin

Figure 1 — Bend test apparatus

The diameter of the mandrel shall be $(6,0 \pm 0,1)$ mm and the gap between the surface of the mandrel and the plates of the hinge shall be $(0,55 \pm 0,1)$ mm.

Other dimensions of the apparatus are not critical.

The mandrel shall be free to rotate on its pin and the apparatus shall be provided with a stop to ensure that when the test piece is bent, the two plates of the hinge are parallel.

5.2 Chamber, capable of maintaining a specified temperature to an accuracy of ± 2 °C throughout the test.

NOTE A suitable range of temperature for most purposes is -40 °C to $+20$ °C.

6 Test specimens

6.1 Sampling

The specimens shall be taken in accordance with EN ISO 15605 and prepared in accordance with EN 1067.

6.2 Dimensions

The thickness of the test specimens shall be $(0,4 \pm 0,1)$ mm but the other dimensions of the test specimens are not critical provided that the test specimen is rectangular and fits into the bend test apparatus. The test specimens shall be without visible flaws.

6.3 Preparation of the adhesive film

The adhesive film shall be $(0,4 \pm 0,1)$ mm thick and prepared by any suitable method.

7 Conditioning

Condition the specimens and test apparatus at the temperature at which the test is to be carried out for a minimum period of 4 h.

8 Procedure

8.1 Pass/fail test

Open fully the bend test apparatus (5.1) and insert a conditioned specimen under the mandrel so that one end is against the stop.

Close the apparatus in not less than 1 s and not more than 2 s thus bending the specimens around the mandrel through 180° (see Figures 1 and 2).

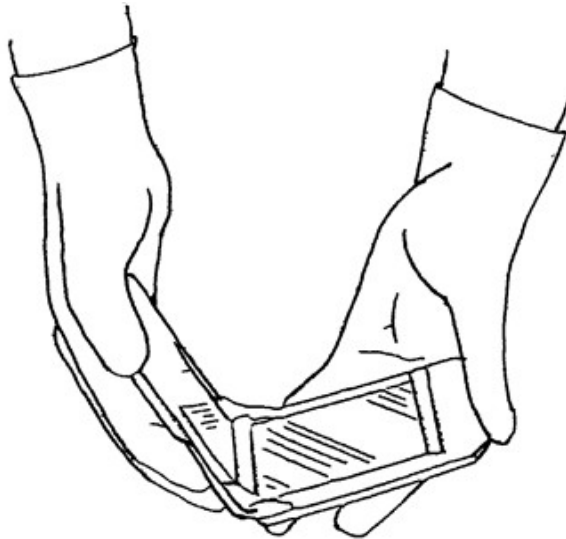


Figure 2 — Bend test apparatus in use

Care should be taken not to affect the temperature of the specimen with the fingers. Tongs conditioned at the test temperature or cotton gloves should be used.

Preferably carry out the test in the chamber (5.2), but in any case ensure that warm air is excluded from the test specimen and mandrel while the test is carried out.

Carry out a series of five tests using different test specimens conditioning the mandrel before each test for an appropriate time to restore it to the test temperature.

Examine the test specimen for visible signs of crazing, cracking or fracture.

If any specimen shows signs of fracture, crazing or cracking, repeat the test.

8.2 Determination of cold crack temperature

Carry out the procedure described in 8.1 over a range of test temperatures at 5 °C intervals using a fresh set of five test specimens at each temperature.

NOTE It is advisable to carry out exploratory tests to determine the broad range within which the cold crack temperature lies.

If any test specimen shows signs of crazing, cracking or fracture, repeat the test.

9 Expression of results

9.1 Pass/fail test

Express the result as a failure at the specified temperature, if two or more of the test specimens show signs of crazing, cracking or fracture (this includes the result of a repeat test if any test specimen in the first set failed).

Alternatively, express the result as a pass at the specified temperature.

9.2 Cold crack temperature

Express the cold crack temperature as the highest temperature at which more than one test specimen shows signs of crazing, cracking or fracture.

10 Test report

The report shall include:

- a) a reference to this European Standard;
- b) identification of the adhesive, giving all information for the sample;
- c) dimensions of the test specimens;
- d) details of the conditioning of the test specimen and test climatic conditions;
- e) the result of the pass/fail test at the specified temperature or the determined cold crack temperature;
- f) date of test.

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