INTERNATIONAL STANDARD

ISO 11897

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Packaging — Sacks made from thermoplastic flexible film — Tear propagation on edge folds

Emballages — Sacs faits d'un film thermoplastique flexible — Propagation de la déchirure sur les plis de bordure

Reference number
ISO 11897:1999(E)

Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11897 was prepared by Technical Committee ISO/TC 122, *Packaging*, Subcommittee SC 2, *Sacks*.

Annex A is for information only.

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Packaging — Sacks made from thermoplastic flexible film — Tear propagation on edge folds

1 Scope

This International Standard specifies a method for the determination, under given conditions, of the resistance to tear propagation on an edge fold of sacks made from thermoplastic flexible film. Measurements on folded and unfolded film permit the determination of the residual resistance in the fold.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 527-3:1995, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets.*

ISO 2233:1994, *Packaging — Complete filled transport packages — Conditioning for testing.*

ISO 4593:1993, *Plastics — Films and sheeting — Determination of thickness by mechanical scanning.*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1
resistance to tear propagation
force that opposes tear propagation in a trapezoidal specimen with an incision and a perforation as shown in Figure 1

3.2
residual resistance
percentage calculated by the equation

$$F_{\text{fold}} / F_{\text{film}} \times 100\ \%$$

where

F_{fold} is the resistance to tear propagation on the fold of the film, in newtons;

F_{film} is the resistance to tear propagation on the unfolded film, in newtons.

4 Specimens

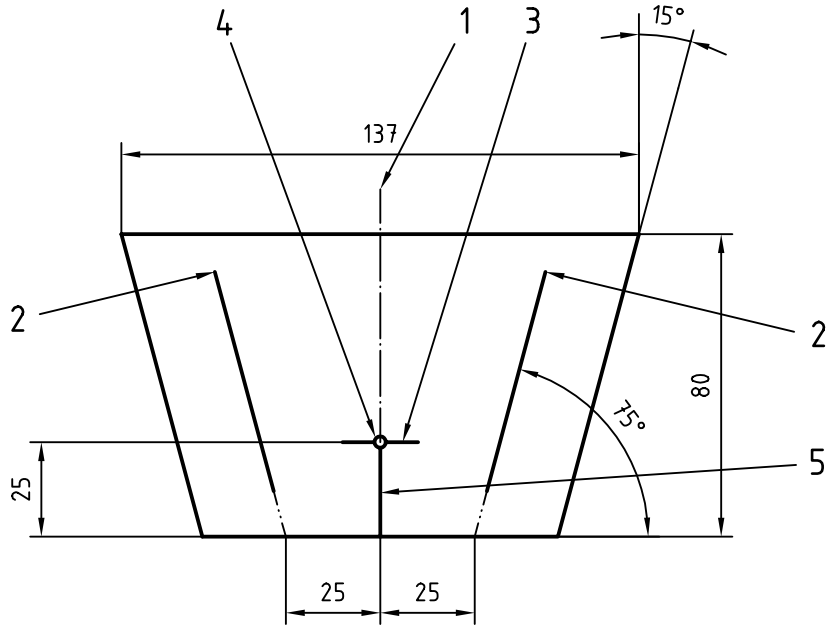
4.1 Sampling and preparation of the specimens

Specimens as shown in Figure 1 shall be taken from the section of film or plastics sack to be tested such that, in the case of specimens including a fold, the incision coincides with the edge fold; specimens not including a fold shall be cut out directly next to the edge fold, and preferably on both sides of it, so that the incision is parallel to the fold.

The specimens shall be cut or punched so that the edges are smooth and free from notches. A template as shown in annex A is recommended for cutting and marking of the specimens.

For the marking as shown in Figure 1, ink or other medium shall be used that does not affect the material under test.

Dimensions in millimetres



Key

1 edge fold
2 marks for clamps
3 mark for perforation
4 perforation
5 incision

NOTE The transverse mark at the inner end of the incision facilitates perforation of the specimen.

Figure 1 — Specimen for determination of resistance to tear propagation on the edge fold

4.2 Number of specimens

Whenever possible, five specimens shall be taken for each edge fold and another five for the unfolded specimens.

5 Test apparatus

5.1 Tensile-testing machine, in accordance with ISO 527-3, where the clamps shall allow the specimens to be held at the marks (see Figure 1). The clamps shall span a width of 100 mm.

5.2 Instrument for measuring the thickness of the specimen in accordance with ISO 4593.

6 Laboratory atmosphere

The tear propagation test shall be performed in standard condition G [temperature $(23 \pm 2)\ ^{\circ}C$, relative humidity (50 ± 5) %] as specified in ISO 2233:1994.

7 Test procedure

Condition the specimen for 24 h in the standard laboratory atmosphere (clause 6).

Measure the thickness of the specimens, close to the base of the incision, on both sides of the edge fold using the method described in ISO 4593.

Fix the specimen in the upper and lower clamps of the tensile-testing machine. The marks on the specimen shall coincide as accurately as possible with the edges of the clamps. Carry out the tensile test at a test speed of 100 mm/min ± 10 %. Note and record the maximum force attained.

8 Evaluation

Calculate the arithmetic mean from the highest values of the force in the individual tests (calculate separate means for the folded and unfolded films). For the resistance to tear propagation, calculate the residual resistance from the ratio of the two values obtained, i.e. $F_{\text{fold}} / F_{\text{film}} \times 100$ %.

9 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) nature and identification of the tubular film or the plastics sack tested;

c) date on which the tubular film or sack and the specimens were produced;

d) number of specimens;

e) prior treatment of the specimens and laboratory atmosphere;

f) thickness of the specimens;

g) resistance to tear propagation of the edge fold F_{fold} in newtons;

h) resistance to tear propagation of the film F_{film} in newtons;

i) residual resistance $F_{\text{fold}} / F_{\text{film}} \times 100$ %;

j) any peculiar behaviour on the part of the specimen during the test, e.g. the tear development and pattern of the crack;

k) any conditions differing from those described in this International Standard;

l) date of test.

Annex A
(informative)

Template for preparing the specimens

An example of a template used to prepare test specimens is shown in Figure A.1.

Dimensions in millimetres

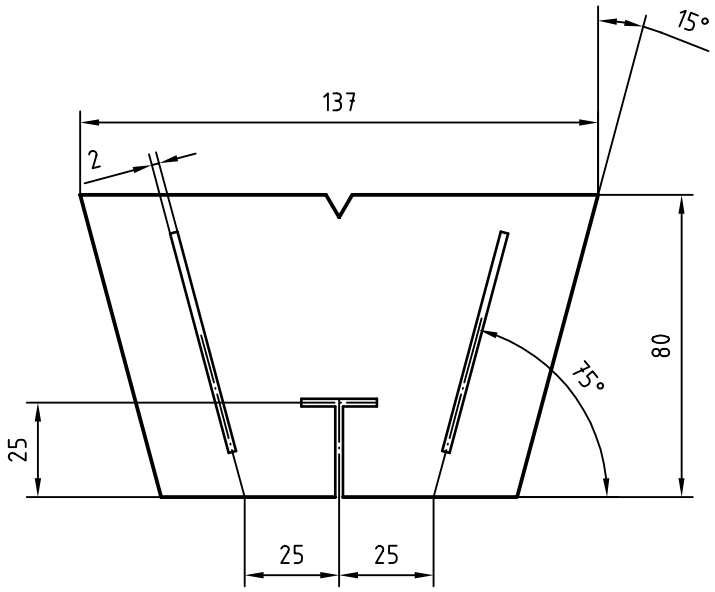


Figure A.1 — Brass template of 2 mm to 3 mm thickness for preparing the specimens

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