



BSI Standards Publication

Packaging — Flexible laminate tubes — Test methods to assess the strength of the side seam

National foreword

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Packaging - Flexible laminate tubes - Test methods to assess the strength of the side seam

Emballage - Tubes souples laminés - Méthodes d'essai pour déterminer la résistance de la soudure longitudinale

Packmittel - Laminattuben - Prüfverfahren zur Bestimmung der Festigkeit der Längsnaht

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Foreword

This document (EN 15387:2011) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

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1 Scope

This European Standard specifies methods for the assessment of the strength of the side seam of flexible laminate tubes.

It is applicable to flexible laminate tubes used for packing pharmaceutical, cosmetic, hygiene, food and other household products.

2 Principle

The burst test and the overlap test serve to assess the strength of the side seam. These tests are complementary.

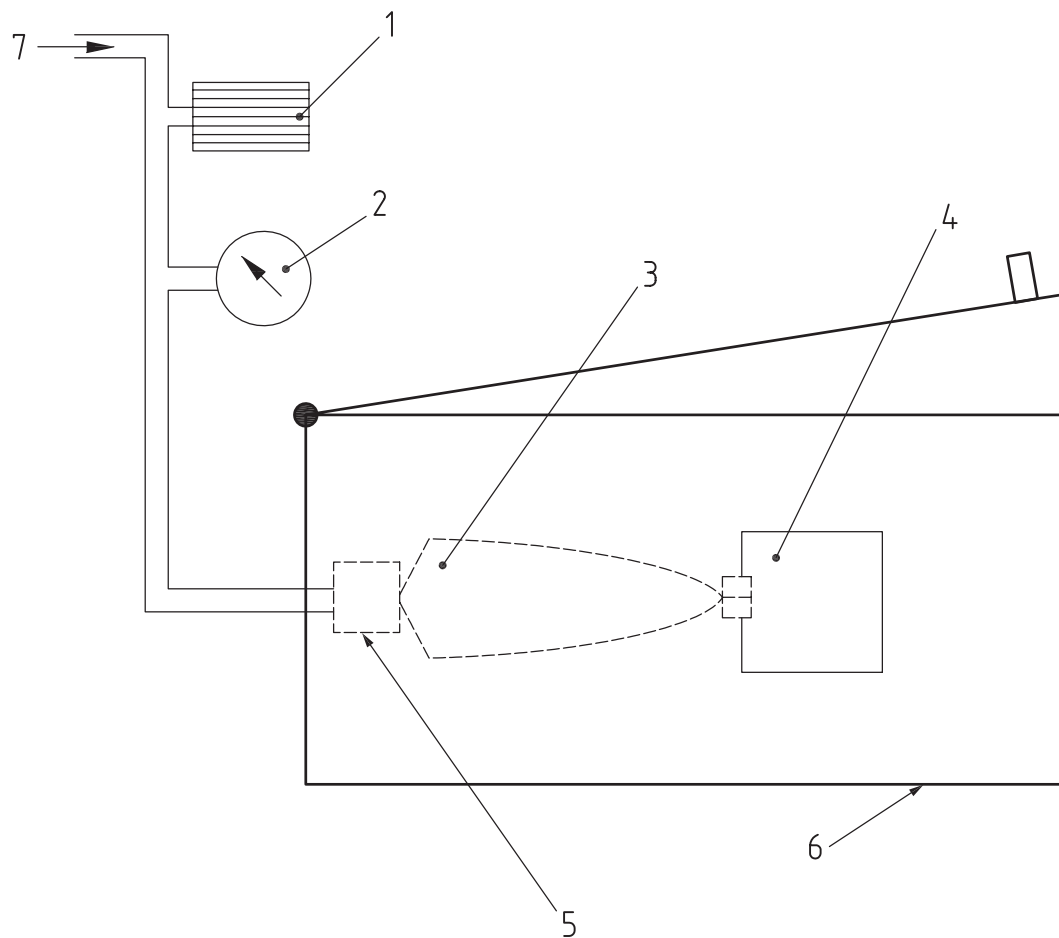
The burst test is used to measure whether the tube can withstand a defined air pressure. In addition the overlap test gives information about possible reasons for an insufficient strength of the overlap of the laminate at the side seam.

3 Test equipment for burst test

3.1 Compressed air system.

Air compressor with an initial minimum pressure of 2 bar equipped with an air regulator allowing a constant and stable pressure.

3.2 Test device.



Key

- 1 Valve
- 2 Pressure gauge
- 3 Tube
- 4 Clamp
- 5 Adaptor for thread
- 6 Protective box
- 7 Compressed air

Figure 1 — Burst test principle

4 Test operation

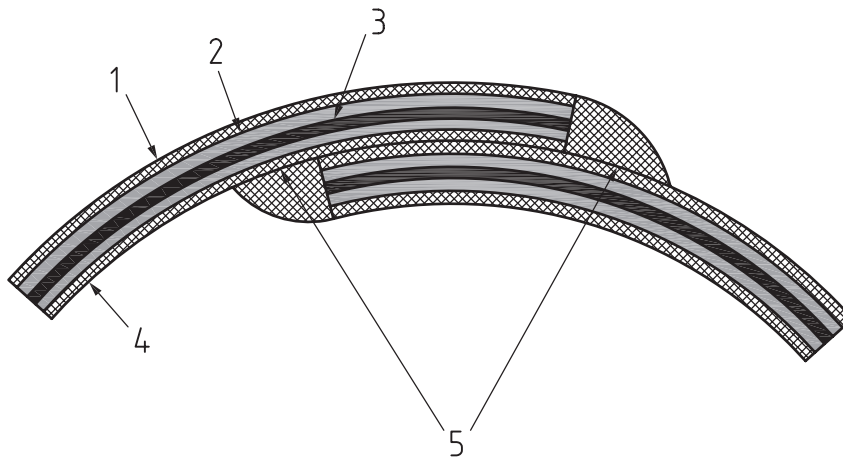
4.1 Burst test

- a) Place the tube in the clamp (side seam centred), close one end of the tube and introduce the air from the other end of the tube.
- b) For tubes with a diameter less than or equal to 40 mm apply a pressure of 2 bar for 10 s. For tubes with a diameter larger than 40 mm apply a pressure of 1,8 bar for 10 s.

- c) The tube shall not burst in the overlap area or the side seam during the 10 s that the pressure is applied. If the tube bursts in any other area than the side seam or the overlap or if the tube does not burst at all, it meets the specifications.
- d) Below 250 µm laminate thickness the test shall be subject to a mutual agreement between customer and supplier.

4.2 Overlap test

- a) An appropriate measure shall be taken to make the inner layer visible. If the inner layer is not visible, samples shall be prepared by using an appropriate contrasting agent.
- b) Cut a cross-section of the tube approximately 10 mm from its open end.
 - 1) If the tube is an ethylene vinyl alcohol (EVOH) barrier laminate, stain the section with a contrasting agent (e.g. iodine solution of 2,5 grams iodine, 2,5 grams potassium iodide, 15 grams distilled water, 80 grams ethanol). This will turn an EVOH barrier layer dark brown or black within approximately one minute and enable it to be seen easily under the magnifying device.
 - 2) If the tube is an aluminium barrier laminate, no additional sample preparation is required.
 - 3) Other plastic or metal laminates will require careful examination to allow correct measurement of the overlap.
- c) Under the magnifying device the side seam will show an overlap of aluminium or a black line with polymer flow around the weld.
- d) Take the reading in mm from the graticule.
- e) The overlap shall be equal to or larger than 1 mm.
- f) The overlap test does not apply to laminate tubes where the tube wall is joined edge to edge.



- Key**
- 1 external layer
 - 2 adhesive
 - 3 barrier
 - 4 inner layer
 - 5 overlap

Figure 2 — Tested side seam

If laminate structures without an aluminium or EVOH barrier are used, a suitable test procedure should be mutually agreed upon between customer and supplier.

5 Test report

If not otherwise agreed between supplier and customer the test report shall contain the following information:

- a) reference to this European Standard and – if necessary – a specification for the method of sampling and acceptance of the batch;
- b) the complete identification of the batch and of the tubes checked;
- c) the number of tubes checked;
- d) the number of defects;
- e) the test result;
- f) all factors which could have affected the results or all operating details not specified in this European Standard;
- g) date, place of test and name of tester.

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