KENYA STANDARD **KS 2483:2013**
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Packaging — Flexible tubes— Determination of puncture resistance-Test methods

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National Environment Management authority
East African Packaging Industries
Kenya flower council
Export promotion council
African Packaging organization
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Africa packaging organization
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REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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Foreword

This standard has been prepared by the Technical Committee on packaging under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Puncture resistance denotes the relative ability of a material to inhibit the progression of a tear once it has been pierced by a cut or a nick. Tests devised to measure puncture resistance are generally application-specific, covering items such as packaging materials. The puncture resistance will depend on the nature of puncture attempt, with the two most important features being point sharpness and force. A fine sharp point such as a hypodermic needle will require a high ability to absorb and distribute the force to avoid penetration, but the total forces applied are still limited.

This standard shall be useful to manufacturers of pharmaceutical, cosmetic, hygiene, food and other domestic and industrial products in checking quality of the flexible tubes.

During the preparation of this Standard reference was made on;

BS EN 14477:2004 Packaging—Flexible tubes—Determination of puncture resistance-Test method.

Acknowledgment is hereby made for the assistance derived from this source.

Kenya Standard

Packaging — Flexible tubes—Determination of puncture resistance-Test methods

1. Scope

This Kenya standard specifies a test method for determining the puncture resistance of a flexible packaging material. The method is applicable to multilayer flexible packaging materials.

2. Principle

A specimen of the flexible packaging material is fastened in a sample holder. A probe penetrates the specimen with a constant speed. The force and the elongation needed to penetrate the specimen are recorded.

3 Apparatus

3.1 Universal testing apparatus, with means of measuring elongation.

3.2 Compression load cell

3.3 Penetration probe made of hardened steel as shown in Figure 1

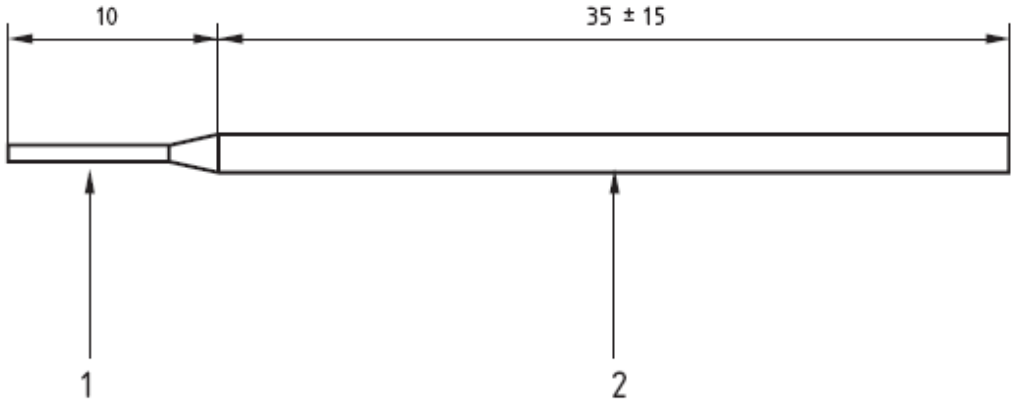
A 0.8 mm diameter probe with a rounded tip is used. The rounded tip of the probe shall have a radius of 0.4mm.

3.4 Fixture for securing the probe to the load cell or to a solid base.

3.5 Sample Holder as shown in Figure 2 or equivalent.

3.6 Blanking punch with an outer diameter matching the diameter of the sample holder shall be used.

Dimension in mm



Key
1 Probe tip 0.8 mm 0.005 mm
2 Probe base ′2.0 mm 0.010 mm

Figure 1 — Penetration probe

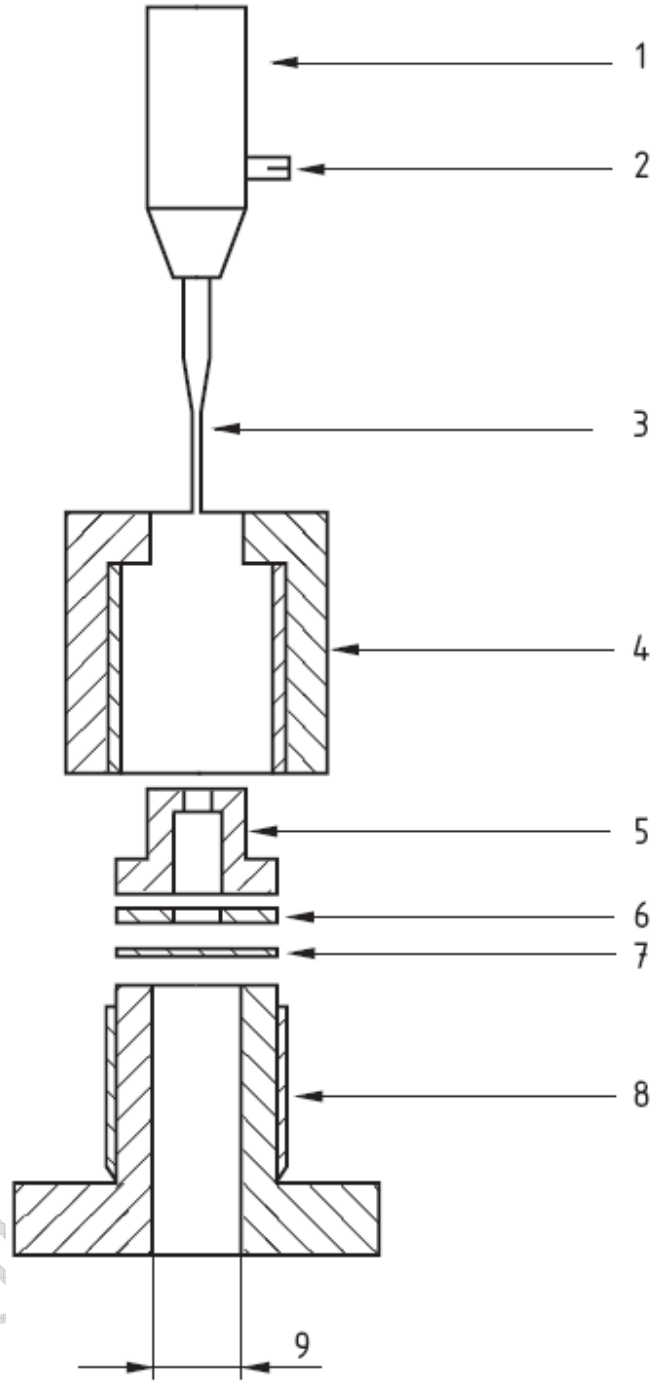


Figure 2 — Example of a sample holder

Key

1 Probe fixture

2 Screw

3 Probe tip

4 Nut

5 Probe guide

6 Friction rubber

7 Specimen

8 Main body

9 Diameter 10 mm ± 0.1 mm

4 Calibration

The probe should be calibrated after at least 1000 measurements using a standard calibrating film made of biaxially oriented PET. The tip of the probe shall at the same time be checked for wear or damage using a suitable microscope. The friction rubber shall be replaced at frequent intervals or at signs of wear.

5 Test specimens

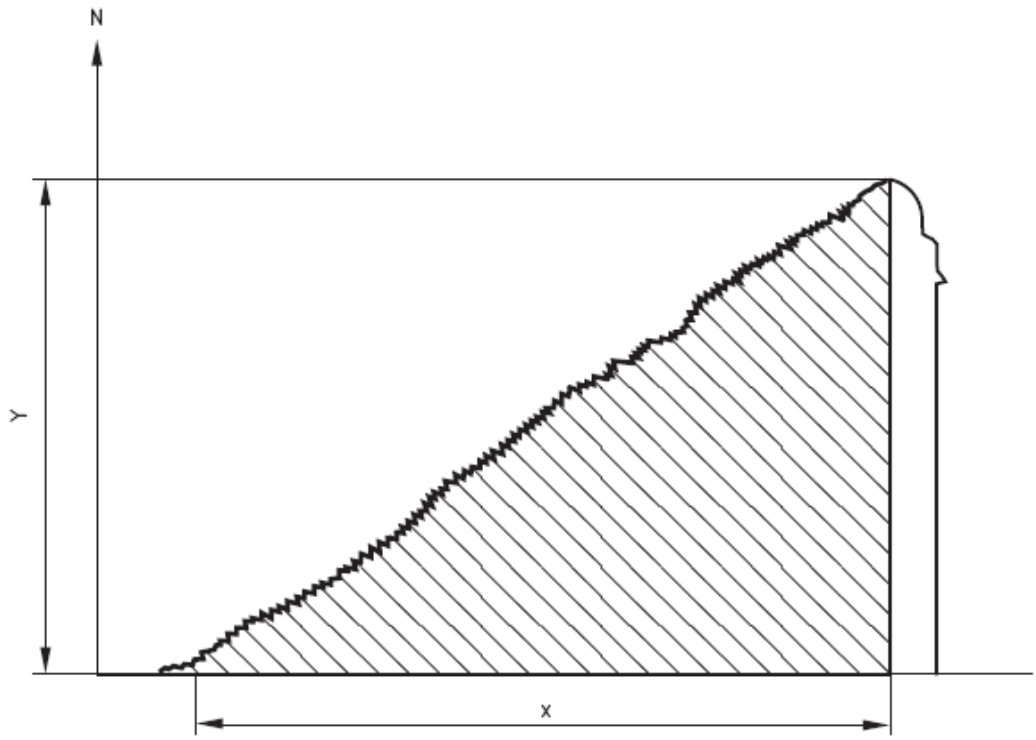
A minimum of 10 specimens shall be cut out evenly spaced across the reel or sheet being tested. Thespecimens shall be conditioned at (23 ± 2)℃ and (50 ± 5)% RH for 48 hours before testing. The test shall becarried out at the same conditions.

6 Probe speed

The test can be carried out at one of the following speeds expressed in mm/min: 1 - 5 - 10 - 50 - 100.

7 Expression and calculation of results

The force is expressed in N and the elongation in mm. For the determination of the energy the integral below the graph showing the force and elongation shall be calculated. Calculate the mean value and standard deviation. A typical graph showing the force and elongation is shown in Figure 3.



Key

Y Force in N

X Elongation in mm

Figure 3 — Graph showing Force and Elongation (Schematic)

8 Test report

The test report shall include the following information:

a) reference to this method;

b) date and place of the test;

c) description of the material being tested;

d) indication of which side of the specimen is being penetrated;

e) speed of the probe;

f) force at break in N, elongation at break in mm and energy in mJ;

g) any unusual features noted during the measurements;

h) any deviation from the method.

