



## DRAFT EAST AFRICAN STANDARD

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Packaging ancillary materials — Specification — Part 1: Pressure sensitive adhesive tape

EAST AFRICAN COMMUNITY

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## Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 066, *Packaging*

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## Packaging ancillary materials — Specification -Part 1: Pressure sensitive adhesive tape

### 1 Scope

This Draft East African Standard specifies the requirements, methods of sampling and test for pressure sensitive adhesive cellulose, plasticized PVC (polyvinyl chloride) unplasticized PVC, polyester, polyethylene, polypropylene tapes used in packaging.

This standard does not apply to tapes with adhesives on both surfaces.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 29864, *Self adhesive tapes — Measurement of breaking strength and elongation at break*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1998 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>.

#### 3.1

##### **pressure sensitive adhesive tape**

tape intended to seal packages

#### 3.2

##### **ancillary materials**

materials associated with packaging operations but are not intended to be part of the final product. These includes but not limited to dessicants, staple pins, adhesives, pressure sensitive adhesive tapes, straps, packaging machinery

#### 3.3

##### **adhesive**

substance capable of holding materials together by surface attachment

#### 3.4

##### **pressure sensitive adhesive tape**

adhesive tape which adheres to a surface upon application of pressure

### **3.5**

#### **adhesive strength**

the minimum force required to cause failure of the adhesive bond

## **4 Requirements**

### **4.1 General requirements**

#### **4.1.1 Workmanship**

**4.1.1.1** The pressure sensitive adhesive tape shall consist of a base film, coated uniformly on one side with a suitable pressure sensitive adhesive composition, requiring no moisture, heat or other special preparation prior to application.

**4.1.1.2** The pressure sensitive adhesive tape shall be free from defects that may affect its functionality. The entire area of one side of the tape shall have a smooth, continuous and uniform coating of adhesive.

**4.1.1.3** The gummed side of the tape shall face the core. The edges of the roll shall be neatly cut and free from fluff.

#### **4.1.2 Splices**

A roll of tape shall not have more than one splice in 20 m and not more than 3 in a roll. The splices shall be so made so as not to separate when unwound from the roll.

#### **4.1.3 Base material**

The tape shall consist of base material that resist penetration of the adhesive and shall be flexible to ensure folding.

#### **4.1.4 Adhesive**

**4.1.4.1** The adhesive used shall be homogeneous and free from solid particles so as to give a smooth finish on application to the base material.

**4.1.4.2** The adhesive shall emit no objectionable odour and shall not be toxic.

**4.1.4.3** The adhesive shall readily adhere to the base material and the tape shall adhere immediately and firmly to clean, dry surfaces without wrinkling, curling, breaking or lifting.

**4.1.4.4** The adhesive shall be such that on unwinding a roll of the tape, adjacent layers shall show no sign of adhering to each other.

### **4.2 Specific requirements**

When tested in accordance with the methods specified in Table 1, the pressure sensitive adhesive tape shall meet the requirements specified therein.

**Table 1 — Physical requirements for Pressure sensitive adhesive tape**

| S/<br>NO. | Parameter   | Type of Base Material |                    |                      |           |              |               |                               | Test<br>Method |
|-----------|---|-----------------------|--------------------|----------------------|-----------|--------------|---------------|-------------------------------|----------------|
|           |   | Cellulose             | Plasticized<br>PVC | Unplasticized<br>PVC | Polyester | Polyethylene | Polypropylene | High density<br>polypropylene |                |
| i         | Minimum tensile strength N per 10 mm width                    | 25                    | 13                 | 25                   | 25        | 10           | 25            | 95                            | ISO 29864      |
| ii        | Minimum elongation percent                                    | -                     | 100                | 15                   | 50        | 100          | 10            | 10                            | ISO 29864      |
| iii       | Minimum adhesive strength to metal and self N per 10 mm width | 2                     | 1.8                | 2                    | 2         | 1.4          | 2             | 1.9                           | Annex A        |
| iv        | Width, mm, $\pm 0.1$  | 2.5                   |                    |                      |           |              |               |                               | Annex B        |
| v         | Length, mm, min.  | 15,000                |                    |                      |           |              |               |                               | Annex C        |

## 5 Packaging

Pressure sensitive adhesive tape shall be packed in materials that prevents it from contamination and damage during normal handling, storage and transportation.

## 6 Labelling and marking

### 6.1 Marking

The core of each roll of pressure sensitive adhesive tape shall be marked on the inside or on the edge with the following information:

- manufactures/suppliers name or trade mark or both;
- words, "Pressure sensitive adhesive tape";
- length and width of the pressure sensitive adhesive tapes;
- base material;
- best before date and
- country of origin

### 6.2 Labelling on the package

Pressure sensitive adhesive tape shall be legibly and indelibly labelled with the following information:



- a) manufactures/suppliers name or trade mark or both;
- b) batch/code number;
- c) words, "Pressure sensitive adhesive tape";
- d) month and year of manufacture;
- e) best before date
- f) length and width of the pressure sensitive adhesive tapes; and
- g) country of origin.

## **7 Sampling**

### **7.1 Lot**

**7.1.1** In any consignment, the rolls of tape made from the same base material and one lot of adhesive and manufactured under the same conditions shall constitute a lot.

**7.1.2** Tests for determining the conformity of the lot to the requirements of the specification shall be done on each lot separately. The number of rolls to be selected from a lot shall depend upon the size of the lot and shall be in accordance with Table 1.

**Table 2— Sampling criteria for pressure sensitive adhesive tapes**

| Lot size<br>N  | Number of rolls to be selected<br>n |
|----------------|-------------------------------------|
| Up to 100      | 2                                   |
| 101-500        | 5                                   |
| 501-1000       | 7                                   |
| 1001 and above | 10                                  |

**7.1.3** The rolls shall be selected at random and in order to ensure the randomness of selection, a random number table shall be used. In case such a table is not available, the following procedure may be adopted: Starting from any roll, count them in one order as 1, 2, 3, \_up to r and so on, where r is the integral part'  $N/n$  being the lot size and n the number of rolls to be selected. Every rth roll thus counted shall be withdrawn to give samples for test.

## **7.2 Acceptance criteria**

Acceptance shall be based on conformity of the lot to the requirements of this standard.

**Annex A**  
**(normative)**  
**Measurement of adhesive strength to metal**

**A.1 Solvents**

One of the following solvents is required:

**A.1.1**    methanol

**A.1.2**    butanone (ethyl methyl ketone)

**A.1.3**    acetone

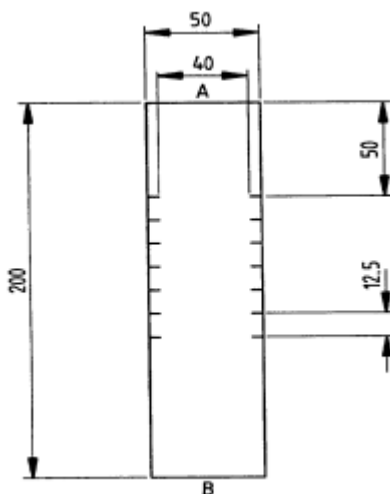
**A.1.4**    Sulphur free toluene

**A.2 Apparatus**

**A.2.1 Five rectangular test plates of stainless steel**, within the following compositional limits:

- a) carbon 0.16 %, max.;
- b) silicon 0.20 %, min.;
- c) manganese 2.00 %, max.;
- d) nickel 8 % to 14 %;
- e) chromium 11 % to 19 %.

A convenient size of plate is 200 mm x 50 mm; the thickness shall be not less than 2 mm. The plate is marked at equidistant intervals of 12.5 mm, along both of the longer edges, the first mark being made at 50 mm from end A (see Figure A.1). The central 40 mm of the test plate width shall be free from marks.



## Figure A.1 — Steel test plate

The test surface of the plate shall be polished to give an abrasive satin finish (180 grit), the direction of gritting being parallel to the longer side of the plate. The surface roughness shall be determined from the mean line of the profile and shall comply with the following:

$$0.05\mu\text{m} < R_a < 0.40\mu\text{m}$$

$$R_{\text{max.}} < 3\mu\text{m}$$

where,

$R_a$  is the arithmetical mean deviation;

$R_{\text{max.}}$  is the maximum height of irregularities.

**A.2.2 Solid brass roller**, 80 mm in diameter and 44 mm in width, covered with rubber approximately 6 mm thick having an IRHD (International Rubber Hardness Degree) of  $60 \pm 5$ ; the mass of the roller shall be approximately 2 kg.

**A.2.3 Power driven tensile testing machine**, but with the back stop or ratchet pawl removed in the case of a pendulum test machine.

### A.2.4 Cleaning materials

**A.2.4.1** 4-hydroxy-4-methylpentan-2-one (diacetone alcohol).

**A.2.4.2** Pharmaceutical quality, lint free cotton wool or paper tissue.

## A.3 Preconditioning

Immediately before pieces for testing are taken, condition each sample roll for at least 24 h at  $23 \pm 2\text{ }^\circ\text{C}$  and  $50 \pm 5\%$  r.h. for at least 2 h immediately before testing. Remove and discard the three outer turns before cutting the test pieces from the conditioned roll.

## A.4 Test pieces

Take five strips of tape 450 mm long, unwound radially from the roll at intervals of 300 mm at a rate of approximately 300 mm/s. Avoid contamination of the adhesive surface and do not allow it to touch the fingers. If the tape is wider than 38 mm, cut a test piece 25 mm wide from it, using a sharp tool to produce clean cut edges. If the tape is 38 mm wide or less, use the tape in the width received.

## A.5 Procedure

### A.5.1 General

Test each strip on a separate plate as described in A.5.2, A.5.3 and A.5.4.

### A.5.2 Cleaning of the plate

Wipe the test surface of the plate with a fresh piece of lint free cotton wool saturated with 4-hydroxy-4-methylpentan-2-one (diacetone alcohol). Dry the plate with fresh cotton wool, then wipe the test surface with a fresh piece of cotton wool saturated with one of the solvents listed in A.1. Dry the plate with fresh cotton wool, then repeat for a total of three cleaning operations with this solvent. Maintain the plate at a temperature of  $23 \pm 2\text{ }^\circ\text{C}$  for at least 5 min before proceeding with the adhesion test procedure.

NOTE 1 Paper tissue may be substituted for cotton wool.

NOTE 2 Cleaning shall be carried out in an area with good fume extraction.

### **A.5.3 Application of test piece**

Apply the test piece as follows:

**A.5.3.1** Place the plate, with the prepared surface upwards, at the edge of a bench with end B nearer the operator (see Figure A.1);

**A.5.3.2** Immediately after obtaining the test piece, apply it, adhesive surface downwards, to the plate with one pass of the roller, allowing approximately 250 mm to overhang end B. Ensure that the tape lies centrally on the plate and parallel to the longer sides and also that no air bubbles are trapped between the tape and the plate;

**A.5.3.3** Place the roller centrally across the test piece on one end of the plate and, taking care not to apply any additional pressure with the hand. Pass the roller at constant speed three more times over the test piece (making a total of twice in each direction) so that each traverse takes from 10 s to 12 s, ensuring that it travels in the exact line of the test piece. Cut off the excess tape overhanging end A.

### **A.5.4 Stripping of test piece**

**A.5.4.1** Allow the plate with the applied test piece to remain undisturbed for 5 min in the conditions given in A.5.3 and complete the test without removal from those conditions.

**A.5.4.2** Double back the free end of the test piece and strip 25 mm to 50 mm from the plate at end B.

**A.5.4.3** Attach end B of the plate to the moving jaw on the testing machine and grip the free end of the test piece in the fixed jaw, ensuring, by inserting packing in the moving jaw (see Figure A.2), that the free tape is parallel in both planes to the applied tape.

**A.5.4.4** Set the traversing jaw in motion and record the readings at five consecutive 12.5 mm interval marks.

## **A.6 Results**

Record the five readings for each of the five tests. Arrange in ascending order the five readings for each test and take the central value of each group. Arrange the five central values so obtained in ascending order and take the central value and divide it by the width of the test sample measured in centimetres. This figure is the adhesive strength to steel measured in Newton's per 10 mm width.

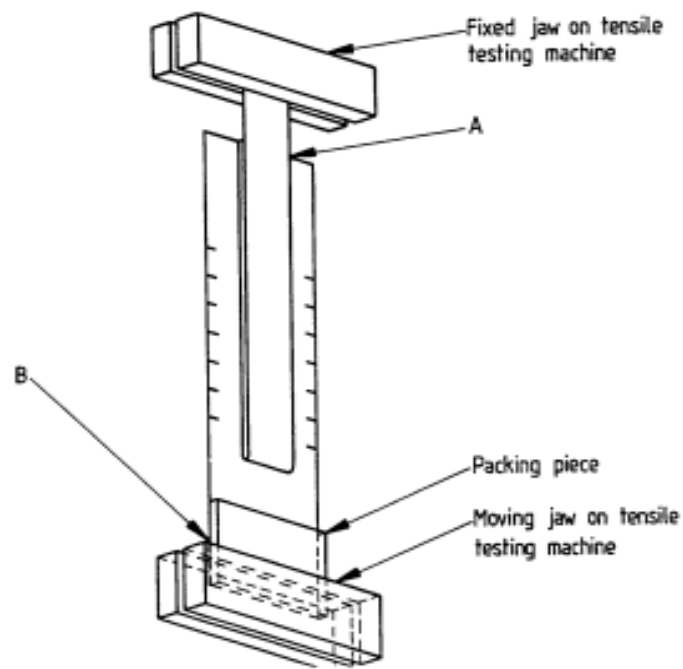


Figure A.2 — Typical arrangement for stripping the tape from the plate

## **Annex B**

**(normative)**

### **Measurement of width**

**B.1** Measure to the nearest 0.5 mm, the width, (parallel to the cross direction of the pressure sensitive adhesive tape ) of each five test specimen taken across full width of five separate rolls and record the average of the results.

**B.2** Measure to the nearest 0.5 mm, the width of each of the five rolls and record the results. Check for compliance with table 1.

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**Annex C**  
**(normative)**  
**Measurement of length**

**C.1** Measure to the nearest 100 mm , the length, (parallel to the cross direction of the pressure sensitive adhesive tape ) of each five test specimen taken across full length of five separate rolls and record the average of the results.

**C.2** Measure to the nearest 100 mm, the length of each of the five rolls and record the results. Check for compliance with table 1.

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## Bibliography

- [1] IS 13262, *Pressure sensitive adhesive tapes with plastic base — Specification*

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