DRAFT EAST AFRICAN STANDARD

Bathroom slippers-Specification

EAST AFRICAN COMMUNITY

Contents

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 064, Footwear.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Bathroom Slippers-Specification

1   Scope

This Draft East African Standard specifies the requirements, sampling and test methods for bathroom slippers with sole made of Ethylene Vinyl Acetate (EVA) and other combinations of which EVA is the most dominant.

2   Normative references

The following referenced 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 48-2, Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD

ISO 2420, Leather — Physical and mechanical tests — Determination of apparent density and mass per unit area

ISO 2589, Leather — Physical and mechanical tests — Determination of thickness

ISO 3376, Leather — Determination of tensile strength and elongation

ISO 3377-1, Leather — Determination of tearing load

ISO 16177, Footwear — Resistance to crack initiation and growth — Belt flex method

ISO 17706, Footwear — Test methods for uppers —Tensile strength and elongation

ISO 20871, Footwear — Test methods for outsoles — Abrasion resistance

ISO 19952, Bathroom slippers — Vocabulary,bathroom slippers

ISO 13287, Personal protective equipment — Footwear — Test method for slip resistance

ISO 20344, Personal protective equipment — Test methods for footwear

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19952 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 Bathroom slippers

a type of bathroom slippers that can be slipped on and off easily made with straps and worn in the bathroom"

4 Requirements

4.1 General Requirements

4.1.1   The material shall be polymer of Ethylene Vinyl Acetate (EVA) and combinations of which EVA is the most dominant.

4.1.2   The sole surface shall be free from blisters, cavities, collapses or blemishes. The die markings shall be neat and clean, and the surface shall have good finish.

4.1.3   The length and the standard sizes designations shall be as given in Annex A.

4.1.4   The minimum sole thickness shall be 12 mm when tested in accordance with ISO 2589 for all the sizes.

4.1.5 The straps shall be trimmed smooth

4.2 Specific Requirements

The physical requirements for sole and the strap material shall comply with the values given in Table 1 and Table 2 respectively when tested in accordance with the test methods specified therein

Table 1 — Physical requirements for sole material

S/N	Characteristic	Requirement	Test method
i.	Density g/cm^3	0.2 – 0.5	ISO 2420
ii.	Hardness (IRHD)	30 – 55	ISO 48-2
iii.	Tensile strength (MPa), min.	1.0	ISO 3376
iv.	Elongation, %, min.	50	ISO 3376
v.	Tear strength, N, min.	35	ISO 3377-1
vi.	Compression set at constant stress, %, max.	35	Annex B
vii.	Flexing resistance: a) Flexing endurance (flexing cycles), min. b) Cut growth at the end of 35 000 cycles at 500 % (mm), max.	35 000 3	ISO 16177
viii.	Abrasion loss (cubic mm), max.	1200	ISO 20871
ix.	Room temperature shrinkage (%), max.	1.0	Annex C
x.	Heat shrinkage for 1 h at 100 °C, (%) max.	2.0	Annex D
xi.	Water absorption, %, max.	5	Annex E
xii.	Split tear strength (N), min.	35	Annex F

S/N				
xiii.	Slip resistance (Coefficient of Friction)			ISO 13287
				ISO 20344

Table 2 — Physical requirements for strap

S/N	Characteristic	Requirement		Test method
		Polyvinyl Chloride (PVC)	Rubber	
i.	Tensile strength (MPa), min.	5	15	ISO 3376
ii.	Elongation, %, min.	150	250	ISO 3376
iii.	Breaking strength (N), min. a) Stem b) Toe c) Heel	 180 180 180	 180 180 180	ISO 17706
iv.	Pull strength (N), min. a) Toe end b) Heel end	 100 100	 100 100	Annex G
NOTE In number iii), test pieces to be cut in lengthwise direction only.				

5 Marking

Bathroom Slippers shall be indelibly and legibly marked with the following information:

   a)   size range;

   b)   name or trademark of the manufacturer;

6   Packing

6.1 Each piece shall be packed with its complementary piece.

6.2 The pieces shall be of the same size and shape (design).

6.3 The pair shall be packed in a suitable material so as to protect the product from damage during transportation and storage

6.4 Each package shall be marked with the following information:

a)   name of item;

b)   batch number;

c)   name or trademark of the manufacturer

d)   Physical address; and

e)   country of origin.

7 Sampling

Sampling shall be done in accordance with annex H.

Annex A
(normative)

Children's range

Table A.1 — Children's range

Size designation	Minimum length mm
3	126
4	135
5	143
6	152
7	160
8	169
9	177
10	186
11	194
12	203
13	211

Table A.2 — Adults' range

Size	Minimum length mm
1	220
2	228
3	237
4	245
5	254
6	262
7	271
8	279
9	288
10	296
11	305
12	313
13	322

Annex B
(normative)

Determination of compression set at constant stress

B.1 Apparatus

Consists of two parallel, flat, rigid plates between which the test piece shall be compressed and the means of which a load of 140 kg ± 1 kg is applied.

B.2 Test piece

The test pieces shall be three discs of diameter 30 mm ± 0.2 mm of any thickness.

B.3 Procedure

B.3.1   Condition the test pieces at 25 °C ± 2°C and 65 % ± 5 % relative humidity for 24 h.

B.3.2   Measure the initial thickness of each test piece at the center using the gauge with part-spherical contact.

NOTE   Take the arithmetic mean of three readings as the initial thickness.

B.3.3   Place the three test pieces on parallel plates of the compression apparatus and subject to a compression load of 140 kg ± 1 kg for 24 h.

B.3.4   Release the load, remove the test pieces and allow to recover.

B.3.5   After 1 h, measure the thickness and note the arithmetic mean as the final thickness.

B.4 Expression of results

The percentage compression set, shall be calculated as follows:

$$\frac{t_o - t_1}{t_o} \times 100$$

where

t_o is the initial thickness in mm; and

t_1 is the final thickness in mm.

Annex C
(normative)

Determination of room temperature shrinkage

C.1 Test piece

Cut from the samples, test pieces of minimum dimensions 125 mm x 5 mm x 15 mm, after splitting all the sides of the sample.

C.2 Conditioning of the test piece

Condition the test piece at 65 % ± 5 % relative humidity and 25 °C ± 2°C for at least 24 h prior to testing.

C.3 Number of tests

Carry out tests on at least three test pieces.

C.4 Procedure

Condition the test piece. Measure the length of the test piece to the nearest 0.1 mm. Keep the test piece suitably in a closed chamber maintained at 25 °C ± 2 °C for 2 weeks. Remove the test piece from the chamber and measure its length again.

C.5 Calculation

The room temperature shrinkage, shall be calculated as follows:

$$\frac{L_0 - L_1}{L_0} X100$$

where

        Lo is the length of the test piece, in mm, before heating; and

        L_1 is the length of the test piece, in mm, after heating for two weeks.

Annex D
(normative)

Determination of heat shrinkage

D.1 Test pieces

Cut test pieces of minimum dimensions 150 mm x 25 mm x 15 mm from post-cured sole by means of a knife.

D.2 Conditioning of test piece

Condition the test piece at 25 °C ± 2 °C temperature and 65 % ± 5 % relative humidity at least 24 h prior to testing.

D.3 Number of tests

Carry out test on at least three test pieces.

D.4 Procedure

Trace the test piece on a piece of white paper. Measure the length of the test piece to the nearest 0.1 mm. Keep the test piece suitably in an oven (Thermostatically controlled) for 1 h at 100 °C ± 1°C. Take out the piece from the oven and cool to ambient temperature. Keep the test piece at room temperature for a minimum 2 h. Trace it again on the same paper and measure the length of the test piece on paper.

D.5 Calculation

The shrinkage, expressed as per cent, shall be calculated as follows:

$$\frac{L_0 - L_1}{L_0} X100$$

Where

L_0 is the length of the test piece, in mm, before heating; and

L_1 is the length of test piece, in mm, after heating and cooling to room temperature.

Annex E
(normative)

Determination of water absorption

E.1 Test pieces

Cut three pieces of 5 mm x 5 mm x 5 mm after shrinking all sides of the sample.

E.2 Conditioning

Condition for 24 h prior to testing at 25 °C ± 2 °C and 65 % ± 5 % relative humidity.

E.3 Procedure

E.3.1   After conditioning the test piece, weigh to the nearest 0.5 mg and immerse in distilled water for a period of 24 h at 25 °C ± 2 °C.

E.3.2   Remove from the water, wipe dry the exposed surfaces with blotting paper.

E.3.3   Weigh the test piece again to the nearest 0.5 mg within 2 min of the removal of the test piece from water.

E.4 Expression of results

The water absorption, expressed as percentage, shall be calculated as follows:

$$\frac{M - M_0}{M_0} \times 100$$

where

M is the mass, in g, of test piece after immersion in water; and

M_0 is the mass, in g of test piece before immersion in water.

Annex F
(normative)

Determination of split tear

F.1   Apparatus

Tensile testing equipment with a rate traverse of 75 mm per minute.

F.2   Conditioning

Condition the samples for 24 h prior to testing at 25 °C ± 2 °C and 65 % ± 5 % relative humidity.

F. 3   Test pieces

After conditioning the test piece, cut three test pieces of 25 mm x100 mm along and across the direction of the bottom material of a bathroom slipper or a sheet. Prepare each test piece by splitting it with a knife or any other suitable method through midway between the top and the bottom surfaces for a distance of 30 mm from one end to form two tongues (see Figure F.1 and Figure F.2).

F.4   Procedure

F.4.1   Clamp one tongue of the test piece on the upper jaw, and the other on the lower jaw.

F.4.2   Start the machine and set the rate of separation speed at a constant rate of 75 mm per minute.

F.5   Results

After the test pieces have separated, note the maximum load and record the arithmetic mean of the three test pieces in Newton (N) as the split tear strength of the sample.
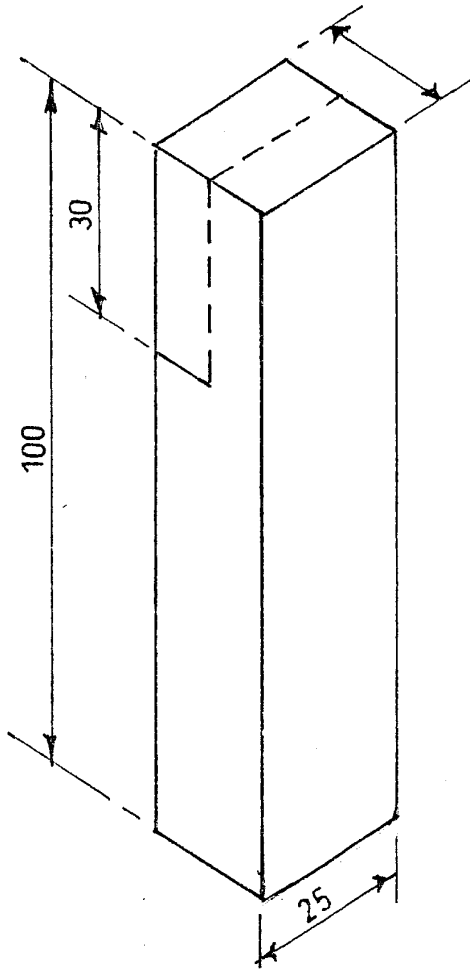
KEY

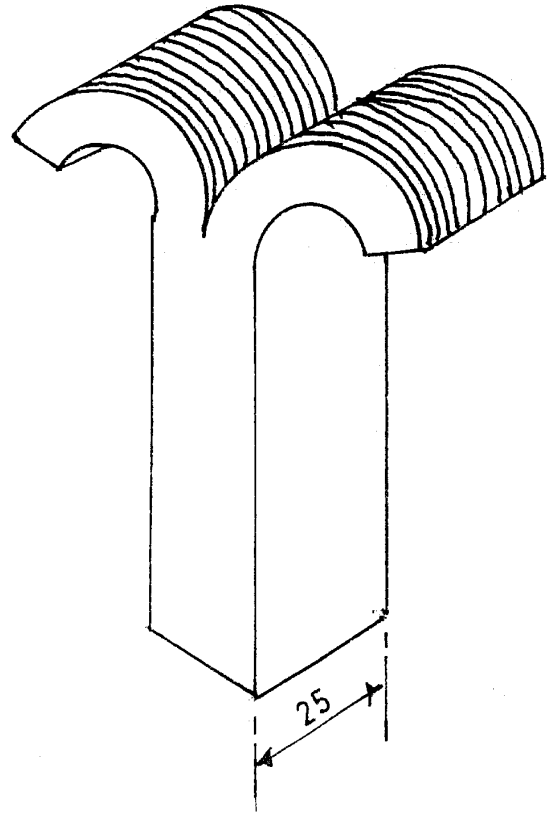Dotted line shows knife cut

Figure F.1 — Test piece before cut

Figure F.2 — Test piece after cut

Annex G
(normative)

Determination of strength required to pull strap from soling hole at the heel and toe end

G.1 Apparatus

Tensile testing machine, with a rate traverse of 75 mm per minute.

G.2 Test piece preparation

Cut the test piece as shown in Figure G.1, to have test pieces as shown in Figure G.2. For each test, cut three test pieces.

G.3 Procedure

Insert one of the test pieces cut from the bottom material (Figure G.1) in the holding device and clamp as shown in Figure G.2 in the tensile testing machine. Pull until the button comes off. Record the force in Newton (N). Record an average of three readings.

G.4 Expression of results

G.4.1 The force required to pull button through the hole in the sole.

G.4.2 Malformation occurring to sole during procedure.
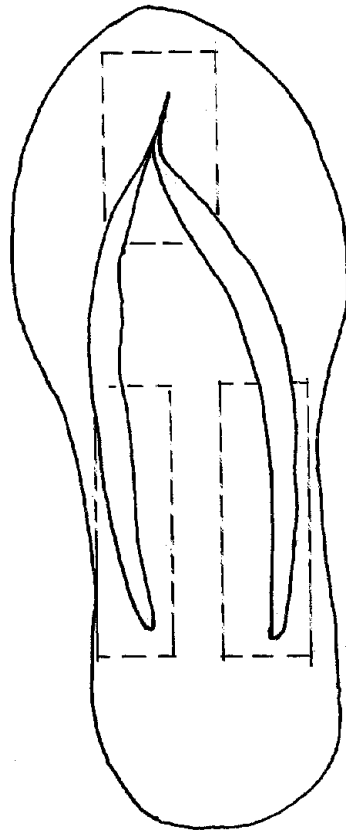
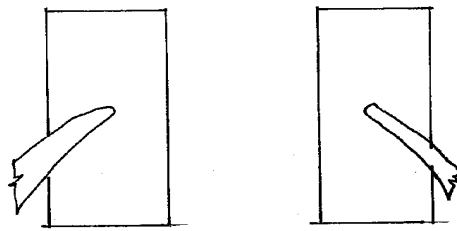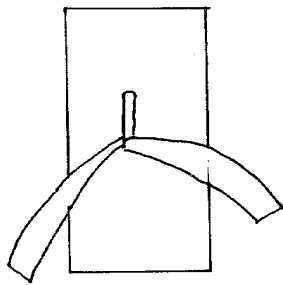**G.4.3** Malformation occurring to strap during procedure.

Figure G.1 —

Figure G.2 —

Annex H
(normative)
Method of Sampling and criteria for acceptance

H.1 Scale of sampling

H.1.1 Samples shall be selected and examined for each lot separately for ascertaining the conformity of the bathroom slippers to the requirements of this standard.

H.1.2 Bathroom slippers shall be considered to be of different lots if they differ in shape, colour, size and design.

H.1.3 The number of bathroom slippers pairs to be selected from any lot shall depend on the size of the lot and shall be in accordance with Columns 1 and 2 of Table H.1.

H.2 Method of selection

H.2.1 Bathroom slippers to be selected from the lot shall be chosen at random. To ensure randomness the procedure in **H.2.3** shall be used.

H.2.2 When the bathroom slippers pairs in a lot are not packed in a number of cases (boxes), the sampling shall be as follows:

Starting from any bathroom slippers pair in the lot, count the pairs as 1,2, etc---up to r and so on in one order. Every r^{th} pair thus counted shall be withdrawn to constitute a sample (r is the integral part of N/n where N is the lot size and n is the sample size). This procedure shall be stopped as soon as the required number of pairs is obtained.

For example, if a sample of 125 pairs is to be selected from a lot of 3 000 pairs, compute r as equal to integral part of 3 000/125=24. Starting from any pair, the bathroom slippers shall be counted in one order and every 24th pair shall be withdrawn.

H.2.3 When the bathroom slippers pairs in a lot are packed in different cases (boxes), a suitable number of boxes (not less than 30 % of the total boxes in the lot) shall be first chosen at random. For each of the boxes so chosen, an approximately equal number of pairs shall be picked up from its different parts so as to obtain the required number of pairs.

For example, if a lot consists of 1 000 pairs of bathroom slippers packed in 50 boxes, each containing 20 pairs, choose more than 15 boxes at random. If it is decided to open 20 boxes, then 4 pairs shall be picked up from different parts of each of the 20 boxes to give a total of 80 pairs as specified in Table H.1.

Table H.1 — Scale of sampling and permissible number of defects

Number of bathroom slippers pairs in a lot	Samples for visually observed defects (Pairs)	Permissible number of defectives (Pairs)	Sample size for laboratory testing (Pairs)	Permissible number of defects (Pairs)
(1)	(2)	(3)	(4)	(5)
Up to 50	13	0	2	0
51 to100	20	1	3	0
101 to 300	32	1	3	0

301 to 500	50	2	5	1
501 to 1 000	80	3	6	1
1 001 to 3 000	125	5	7	2
3 001 and above	200	7	8	3

H.3 Defects

All randomly selected bathroom slippers pairs (Table A.1, Column 2) shall be inspected for visually observed defects, i.e:

   a) difference in shape, design and colour;
   b) odd pairing and incorrect size;
   c) distorted shapes;
   d) blow holes and blisters;

H.4 Acceptance criteria

The number of defective bathroom slippers pairs shall not exceed the permissible number given in Table H.1, Column 3. If the number of defective pairs exceeds the permissible number of defectives, the lot shall be rejected.

In case the lot has been found satisfactory for visually observed defects, sample pairs for laboratory testing (Table H.1, Column 4) shall be taken from among those drawn (Table H.1, Column 2). The pairs shall be chosen at random and tested for dimensional and physical characteristics. If the number of defective bathroom slippers is less than or equal to the corresponding permissible number of defectives given in Table H.1, Column 5, the lot shall be declared to have met the requirements of this standard. Otherwise if the defective bathroom slippers pairs are more than the corresponding permissible numbers of defectives, the lot shall be rejected

Bibliography

KS 1620:2021 Bathroom Slippers-Specification