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DRAFT EAST AFRICAN STANDARD

Plastic cup — Specification

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 072, *Plastics and related products*.

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.

Plastic cup — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for plastic cups, with or without handles used for food contact.

This standard is not applicable to disposable plastic cups and medical cups.

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.

EAS 1086, *Plastics — Codes for resin identification on plastic products*

3 Terms and definitions

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

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

— IEC Electropedia: available at http://www.electropedia.org/

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

3.1
cup
small bowl-shaped container typically used for holding and drinking liquids

3.2
Brimful capacity
volume of liquid held by the plastic cup when filled to the point of overflowing while standing on a flat horizontal surface

3.3
nominal capacity
volume of the liquid the plastic cup is intended to hold

4 Requirements

4.1 General requirements

4.1.1 Material

All materials used in the manufacture of the plastic cups shall be virgin food grade.

4.1.2 Rim

The rim shall be reinforced to prevent ovaling and shall have smooth edges to avoid injury to the user.

4.1.3 Handle

4.1.3.1 Shall be of adequate size, grip and strength to support the weight of the cup and its contents and shall not be injurious to the user.

4.1.3.2 Shall have a mean thickness not less than 1.5 times the wall thickness, except where it joins the cup.

4.1.4 Finishing

4.1.4.1 The plastic cup shall have a smooth clean finish, well made and free from any visible defects such as spots, bubbles, holes, cracks, impurities, moulding flash, colour variations, peeling, raptures and surface scratches.

4.1.4.2 Decorations shall be incorporated in such a manner as to become an integral part of the piece and shall be as durable as the undecorated surface.

4.2 Specific requirements

4.2.1 The cup shall conform to the specific requirements specified in Table 1 when tested in accordance with the test methods prescribed therein

Table 1 — Specific requirements of plastic cup

S.No	Characteristic	Requirement	Test method
i.			
ii.	Impact resistance	Remain intact	Annex A
iii.	Load resistance	No ovaling of the rim and no deformation	
iv.	Brimful capacity, l, min	4% greater than the nominal capacity	Annex B
v.	Handle strength	No damage to the handle	Annex D

4.2.2 The dimensions shall not be less than those indicated when tested in accordance with Annex C, tolerance of ±2 percent shall be permitted.

4.2.3 Thickness and depth ─ The thickness and depth when determined as prescribed in Annex C shall not be less than that specified in Table 2 for the given nominal capacity and shall be maintained over at least 80 percent of the total area of the plastic cup.

Table 2 — Minimum thickness for the given nominal fluid capacity of the plastic cup

S/No	Nominal fluid capacity, ml	Depth, min, mm	Thickness, min, mm
i.	Up to 100	40	2.0
ii.	101 to 150	40	2.5
iii.	151 to 250	40	3.0
iv.	251 to 550	40	4.0

4.2.4 Resistance to wet heat ─ when tested by the method described in Annex E:

a) the plastic cup shall not; develop cracks, show signs of surface marking and any other defect that would impair their serviceability or appearance;

b) the internal volume of the plastic cup shall not be reduced by more than 4 percent of the initial value, and

c) it shall not be possible to insert a 0.375 mm feeler gauge at any point between the feet or base of the plastic cup and a flat surface when the plastic cup is placed as normally used on the flat surface and held firmly in place by exerting light pressure with one finger at the centre of the base.

4.2.5 Resistance to dry heat ─ when tested by the method described in Annex E, the requirements specified in 4.2.4(a) to 4.2.4(c) shall be satisfied.

4.2.6 Ink adhesion ─ The printed cups, when tested by the method described in Annex F, shall show no sign of printed ink or paint removal.

5 Packaging

Plastic cups shall be packaged to maintain their integrity during, storage, transportation and handling.

6 Marking and labelling

6.1 Marking

The plastic cup shall be legibly and indelibly marked in English and/or any other official language with the following information:

a) nominal capacity in litres;

b) code of resin identification and symbol for recycling in accordance with EAS 1086;

c) name of the manufacturer and/or trademark;

d) food grade material symbol;

e) batch or code number; and

f) country of origin.

6.2 Labelling of bulk package

6.2.1 The bulk package shall contain cups of the same size and make

6.2.2 The bulk package shall be legibly and indelibly labelled in English and/or any other official with the following information:

a) name and physical address of manufacturer and/or registered trademark;

b) name of the product as, “Plastic cups”;

c) declaration of the number of plastic cups in the bulk package; and

d) country of origin.

7 Sampling

Sampling shall be done according to Annex G

Annex A
(normative)

Impact resistance and load resistance test

A.1 Impact resistance test

A.1.1 Procedure ─ At a temperature of 27 ˚C ± 2 ˚C, drop a cup freely, facing bottom-down, from a height of 1.2 m, onto a level cement floor three times.

A.1.2 Result ─ The cup shall remain intact.

A.2 Load resistance test

A.2.1 Place a load of mass, m calculated according to the formula below:

m=**ρV**

where

ρ is density of the fluid; andv is the nominal capacity of the cup

Note: for uniformity water shall be used as reference fluid

A.2.2 Carry the cup by its handle for 30 seconds observing the rim and the entire body of the cup.

A.2.3 No ovaling of the rim and no deformation shall be recorded.

Annex B
(normative)

Test for brimful capacity

B.1 Apparatus

B.1.1 A rigid transparent plastic disc with a slot (see Figure B.1) big enough to completely cover the cup.

B.1.2 Weighing balance to determine the mass of the cup to an accuracy of 1 g.

B.2 Procedure

B.2.1 Weigh the cup and the rigid transparent plastic disc to an accuracy of 1 g.

B.2.2. Fill the cup with water to within approximately 3 mm of brim. The water used should be at ambient temperature or at 27 ºC ± 2 ºC.

B.2.3 Place the rigid transparent plastic disc on the neck face and top up by carefully pouring water through the slot until the water is seen just contacting the underside of the disc.

B.2.4 Weigh the filled cup, together with the rigid transparent plastic disc.

B.2.5 The difference in weighings is the mass of the water recorded in grams. The results shall be expressed to the nearest millilitres.

B.3 Result

The mass of the water in grams or the volume of water measured is numerically equal to the brimful capacity of the cup in millilitres.

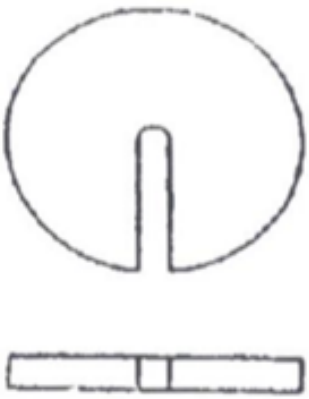

Figure B.1 — Transparent plastic disc

Annex C
(normative)

Measurement of dimensions

C.1 Depth

C.1.1 Apparatus ─ Micrometer gauge

C.1.2 Procedure ─ Place the cup on a flat surface and measure to the highest point on the cup using a micrometer gauge at two positions as follows:

a) Close to but avoiding the part line; and

b) At 90° to the position specified at (a).

C.1.3 Calculation ─ The depth is recorded as the mean of the two readings. The accuracy or measurement shall be 0.1 mm.

C.2 Measurement of wall thickness

C.2.1 Apparatus ─ Micrometer/screw gauge or dial caliper gauge giving an accuracy of measurement of 0.02 mm

C.2.2 Procedure ─ The container wall thickness shall be ascertained by either of the methods indicated below.

C.2.2.1 Micrometer method ─ Cut the cup horizontally into three pieces (top, middle and bottom) with a pair of scissors or hacksaw blade. Measure the wall thickness with a micrometer or screw gauge fitted with ball point tip, at four places in each section. Take the average of four readings and report as wall thickness at top, middle and bottom.

C.2.2.2 Dial caliper gauge method ─ Measure the wall thickness with the help of dial caliper fitted with spherical anvils. Care shall be taken to avoid movement of the cup during measurement as this may affect the reading obtained. The measurement shall be to an accuracy of 0.02 mm. Take the mean of three readings at any location (top, middle and bottom) as wall thickness

Annex D
(normative)

Handle pull test

D.1 Method

D.1.1 Apparatus – A suitable device to hold the cup firmly in position.

D.1.2 Procedure – Fill the cup to the nominal capacity with water. Fix the cup in position and attach weight equal to double the nominal capacity of the cup on the handle using a hook. Keep for 24 h and examine for any damage to the handle or the hinges.

D.2 Results

There shall be no damage to the handle.

Annex E
(normative)

Wet and dry heat resistance tests

E.1 Wet heat resistance test

The plastic cup shall be immersed in water maintained at boiling point for 30 minutes, and then removed and allowed to stand for 1 hour at room temperature. This cycle shall he repeated three times, making a total of four cycles. The plastic cup shall then be conditioned for 24 hours at ambient temperature. In case of dispute, the article shall be conditioned for 24 hours at 27 °C ± 1 °C at a relative humidity of 65 % ± 2 %. The article shall thereafter be inspected for compliance with 4.2.4.

E.2 Dry heat resistance test

The plastic cup shall be placed in an air-circulating oven at a temperature of 77 °C ± 2 °C for 8 hours, and then removed and allowed to cool. It shall then be conditioned for 24 hours at ambient temperature. In case of dispute, the plastic cup shall be conditioned for 24 hours at 27 °C ± 1 °C at a relative humidity of 65 % ± 2 %. The article shall thereafter be inspected for compliance with 4.2.4.

Annex F
(normative)

Ink adhesion test

F.1 Procedure

Apply two strips of 25 mm wide transparent pressure sensitive tape or cellophane tape to the printed area of container; one piece down the height and the other round the circumference of the cup. Press the tape firmly on to the container and leave it for 15 s. Remove the tape by pulling slowly at about 1 cm/s pulling rate from one end at 90° to the container surface.

F.2 Results

There shall be no removal of the print from surface of the container and the print shall be legible to the naked eye after the test.

Annex G
(normative)

Sampling

G.1 Scale of sampling

G.1.1 Lot ─ In a single consignment, all the plastic cups of identical description, produced under relatively similar conditions of manufacture, such as the same batch of production and the same batch of raw material, shall constitute a lot.

G.1.2 Samples shall be selected and examined for each lot separately to ascertain conformity of the lot to the requirements of this specification.

G.1.3 Number of Samples ─ From each lot, 17 articles shall be selected for carrying out various tests specified in this standard with a view to ascertaining conformity of the lot to the requirements of this standard.

G.1.4 The plastic cups shall be selected at random from the lot. If the articles in the lot are packed in different boxes, about 10 percent of the boxes, subject to a minimum of 2, shall be chosen at random and from each box so chosen, approximately equal number of articles shall be taken at random so as to make up 17 in all.

G.2 Number of tests and criteria for conformity

G.2.1 All test samples selected in G.1 shall be examined for the requirements specified in 4.1.1 to 4.1.4. The lot shall be considered acceptable in respect of these requirements if each of the 17 test samples individually satisfies each of these requirements.

G.2.2 If the lot has been declared acceptable in G.2.1, then out of the 17 test samples, 2 test samples shall be taken at random. Each of these shall be tested for requirements specified in 4.2.1 to 4.2.6. The lot shall be considered acceptable in respect of these requirements if each of the 2 test samples individually meets all these requirements.

Bibliography

[1] IS 2798:1998, *Methods of test for plastics containers*

[2] IS 9220 (1979), *Tableware Made of Melamine Plastics*

[3] US ISO 13106:2014, *Plastics — Blow-moulded polypropylene containers for packaging of liquid foodstuffs*

[4] EAS 354: 2004, *Plastic containers for up to 5 litres capacity — Specification*

