DEAS 354: 2025

ICS 55.120

Second Edition

DRAFT EAST AFRICAN STANDARD

Plastic containers for up to 5 litres capacity — Specification

Public Review Draft

EAST AFRICAN COMMUNITY

© EAC 2025

Second Edition 2025

Copyright notice

This EAC document is copyright-protected by EAC. While the reproduction of this document by participants in the EAC standards development process is permitted without prior permission from EAC, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from EAC.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to EAC's member body in the country of the requester:

© East African Community2019 — All rights reserved
East African Community
P.O.Box 1096,
Arusha
Tanzania
Tel: + 255 27 2162100
Fax: + 255 27 2162190
E-mail: eac@eachq.org
Web: www.eac-quality.net

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

Public Review Draft

© EAC 2025 – All rights reserved

Contents

Page

Public Review Draft

© EAC 2025 – All rights reserved

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*.

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.

With regard to the first edition (EAS 354: 2004), the following changes have been made in this Second

edition:

- The normative reference was added as a stand-alone clause and updated appropriately.
- Clause 3 rephrased to read, terms and definitions.
- Subclause 3.1 deleted from the standard.
- 27^0c temperature was deleted from the standard and replaced with room temperature.
- Addition of a new subclause 2.12 on the definition of food grade material.
- Modification of clause 3 to be general requirements and numbered appropriately.
- Deletion of clauses 4, 4.1, 4.1.1, 4.1.2, 4.2 on construction.
- Clauses 4.3, 4.3.1, 4.3.2 were reorganized under Specific Requirements.
- Clause 4.4 was reorganized under Specific Requirements. Subclause 4.4.1 and Table 1 were deleted, and a reference was made to Table 2 in subclause 4.4.2. Furthermore, the title of subclause 4.4.2 and the accompanying text were revised and Table 1 updated accordingly.
- Clause 4.5 updated.
- Clause 4.6 modified with the deletion of the phrase “pits and flashing”.
- Clause 5 reorganized under specific requirements.
- Clauses 5.2 and 5.3 were merged into one clause
- Clause 5.4 was modified.
- Addition of a new test method for testing the parameter in clause 5.6 and deletion of the older one.
- Addition of a new clause 5.10 wall thickness and corresponding test method for determining the parameter reference as annex K.
- Modification of clause 6 to read Marking and Labelling. New subclauses 6.1 Marking and 6.2 Labelling were introduced to clearly distinguish the requirements that should appear on the container from those that should appear on the label.
- Deletion of the standard referenced in clause 7 and replacing with ISO 2859-1
- Rearrangement of all the annexes in standard and referenced correctly.

Public Review Draft

 © EAC 2025 – All rights reserved

Plastic containers for up to 5 litres capacity — Specification

1 Scope

This Draft East African Standard covers minimum requirements for plastic containers of nominal capacities up to and including 5 litres intended for storage of commodities other than explosives, compressed gases and radioactive materials.

2. Normative reference

ISO 2859-1 *Sampling procedures for inspection by attributesPart 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.*

ISO 4787:2021(en) *Laboratory glass and plastic ware — Volumetric instruments — Methods for testing of capacity and for use*

3 Terms and Definitions

For the purposes of this standard, the following definitions shall apply:

3.2 batch

The containers of the same design and type produced from the same grade of polymer by the same converting unit.

3.3 closure

A device that effectively closes and seals an opening in a container.

3.4 blow moulded container

A container formed from a parison of heat-softened thermoplastics material by the application of pneumatic pressure which forces it against the internal walls of a blow mould.

3.5 part line

A line on the container corresponding to a parting joint of the blow mould.

3.6 brimful capacity

The volume of liquid held by the container when filled to the point of overflowing atroom temperature, while standing on a level surface.

3.7 nominal capacity

The volume of liquid the container is intended to hold atroom temperature.

3.8 ullage

The difference between brimful capacity and nominal capacity expressed as a percentage of the nominal capacity.

3.9 container mass

Public Review Draft

© EAC 2019 – All rights reserved

The mass in grams of a fully finished empty container excluding the closure.

3.10 neck face

The uppermost surface of the container neck.

3.11 defective

A container that fails in one or more respects to comply with the appropriate requirements of the specification.

3.12 Food grade material

Add definition for food grade material as “material, made of substances which are safe and suitable for the intended use and which will not impart any toxic substance or undesirable odour or flavour to the food product.

4. Requirements.

4.1 General Requirements.

4.1.1 Container

4.1.1.1 Containers shall be made of an effective plastics material. Regranulate maybe blended with virgin material provided that the physical and chemical properties of the material in the finished containers comply with the requirements of Section 5. Containers intended to come into food contact shall be made of food grade materials.

4.1.1.2 The colour of the material in the finished container shall be an acceptable match to that specified by the commodity for which the container is intended and, when so specified by the purchaser, shall retain such compatibility for the life-span.

4.1.1.3 Any additives such as fillers, plasticizers, antistatic agents, pigments, and inhibitors, shall be compatible with the polymer and shall not deleteriously affect the commodity for which the container is intended.

4.1.1.4 Plastic materials and articles intended to come into contact with food shall be manufactured in compliance with Good Manufacturing Practice so that under their normal or foreseeable conditions of use, they do not transfer constituents to foodstuffs in quantities which could.

a) endanger human health or

b) bring about unacceptable change in the composition of the foodstuffs or

c) deterioration in the organoleptic characteristics there off.

4.1.1.5 Plastic containers shall be stored away from direct sunlight as this may cause discoloration and degradation of the container.

4.1.2 Closures

The material of closure that is of a different plastic material to that of the container shall comply with the requirements of 3.1.

Public Review Draft

 © EAC 2025 – All rights reserved

4.2 Specific requirements.

4.2.1 Dimensions

The tolerances on dimensions specified refer to finished empty containers. Dimensions of filled containers will show differences.

4.2.1.1 Container height to neck face

The tolerances on container height shall be ± 1.0 % or ± 0.5 mm, whichever is greater. When measured in accordance with Annex A

4.2.1.2 Container diameter

The tolerances on external container diameter at an agreed height shall be ± 1.5 % or ± 0.25 mm Whichever is the greater when measured with the method described in Annex B

NOTE The circumference normally gives the mean diameter directly.

4.2.2 Capacity

4.2.2.1 Manufacturing tolerances on nominal capacity

Capacities shall be an agreement between the purchaser and the supplier. The manufacturing tolerance on the nominal capacities shall be as shown in table 1.

Table 1 — Manufacturing tolerances on nominal capacity

Nominal capacity	Tolerance	Test method
Up to including 25 ml Over 25ml up to and including 100 ml Over 100 ml up to and including 500 ml Over 500 ml up to and including 1 L Over 1 litre up to and including 5 L	± 10 % ± 5 % ± 2.5 % ± 2 % ± 4 %*	ISO 4787
*The ± 4 % tolerance of brimful capacities over 1 litre is necessary because of special manufacturing difficulties due to shrinkage with large containers. Nevertheless, with particular manufacturing methods it may be possible to achieve a ± 2 % tolerance. The tolerance quoted should be in addition to percentage ullage allowance.		

4.2.3 Container mass

The tolerances on container mass shall be as shown in Table 2 when measured in accordance with the method described in Annex C

Table 2 — Tolerance on container mass

Mass of container	Tolerance
Up to and including 10 g Over 10 g up to and including 25 g Over 25 g	± 10 % ± 7.5 % ± 5

4.2.4 Finish and workmanship

Public Review Draft

© EAC 2025 – All rights reserved

The finish and workmanship shall be acceptable, both the inside and outside of a container shall be acceptably free from plastics defects, and pigmentation shall be evenly distributed. The finish of the sealing surfaces of the container shall comply with the requirements of 5.5

4.2.5 Resistance to vibration

When a container is tested in accordance with the method described in Annex D there shall be no leakage.

4.2.6 Impact resistance

When a container is tested, in accordance with the method described in Annex E by being dropped through the appropriate height given in Table 4, it shall show no sign of failure.

NOTE In the case of an open-head container, slight leakage on the surface between the body and lid during impact shall not be regarded as failure provided that immediately after pressure equalization the closure re-seals and no further leakage is visible when the container is placed on its side with the point of impact at the lowest position.

Table 3 — height of drop

1	2	3
Height of drop, m		
Containers for solids	Containers for liquids	Density of liquid commodity < 1.2
	Density of liquid commodity < 1.2	
0.8	0.8	Density ÷ 1.5

4.2.7 Resistance to air-leakage

When a container is tested in accordance with Annex F or any other applicable test method. The container shall not show signs of leakage.

4.2.8 Efficacy of closures (non-vented type only)

When a closure is tested in accordance with Annex I it shall not leak.

NOTE For commodities that require vented closures, the closure shall comply with the requirements of the transportation authorities.

4.2.9 Resistance to compression/Stack load

When a container is subjected, in accordance with Annex J, to the relevant mass-load given in Table 5 it shall not collapse and shall show no deformation under load likely to reduce its strength or to cause instability in stacks.

Public Review Draft

© EAC 2025 – All rights reserved

Table 4 — Mass-load

1	2
Nominal capacity, ml*	Mass-load, kg
50	0.5
100	1.0
150	1.5
200	2.0
250	2.5
500	5.0
1000	10.0
2000	20.0
3000	30.0
4000	40.0
5000	50.0
* Obtain the mass-load for an intermediate nominal capacity by linear interpolation between the appropriate two values given in Column 2.	

4.2.10 Handle strength

After testing in accordance with Annex H, both the handle(s) and the container shall be in usable condition.

4.2.11 Compatibility with the relevant commodity

NOTE Either Method A or Method B shall be used, as agreed upon between purchaser and supplier.

4.2.11.1 Compatibility (When assessed by Method A)

When test specimens cut from sample containers are tested in accordance with Annex I they shall comply with the following requirements:

a) Exposure to the commodity shall not cause a test specimen to

i) change colour

ii) develop blisters; or

iii) become embrittled.

b) The commodity shall not be discoloured by the test specimens.

c) Any loss of mass of a test specimen shall not exceed 0.5 % of its mass before exposure.

d) No dimension of a test specimen after exposure shall differ from its value before exposure by more than 3 %.

e) The percentage elongation at break of specimens exposed to the commodity shall not be less than 90% of the percentage elongation of specimens not exposed to the commodity.

4.2.11.2 compatibility (When assessed by Method B)

After exposure, in accordance with Annex I Part 2, to the relevant commodity, a container shall still comply with the requirements of 5.2, 5.3, 5.4, (where relevant), and 5.6.

4.2.12 Resistance to environmental stress cracking

Public Review Draft

© EAC 2025 – All rights reserved

When a container is tested in accordance with Anne J - , it shall not leak and shall show no sign of stress cracks.

4.2.13 Wall thickness.

The wall thickness shall be measured in accordance with the method described in Annex K. The minimum wall thickness at any point of the container shall be not less than 0.20 mm.

5 Marking and Labelling.

5.1 Marking.

Each container shall bear the following information legibly embossed on fixed part of the container:a) The Manufacturer's identification mark;

b) Material and recyclable mark.

c) cavity number.

c) Any additional information required by the purchaser.

5.2 Labelling.

Each container shall bear the following information legibly and indelibly labelled on fixed part of the container.

a. The nominal capacity, in millilitres (ml) or litres (L);
b. manufacturer’s name and physical address and/or registered trademark.”
c. Batch number
d. Manufacturing date.
e. Any additional information required by the purchaser.

6. Sampling and compliance with the specification

Sampling and criteria for compliance shall be conducted in accordance with ISO 2859-1, Sampling procedures and tables for inspection by attributes.

7 Inspection and methods of test

7.1 Inspection

Visually examine and check each container in the sample for compliance with the applicable requirements of Sections 4 and 6. 1.

7.1.1 Effectiveness of surface treatment test — Procedure

Paint the container surface with a thin coating of a solution consisting of 20 % rotagranure ink in nbutyl acetate. Allow to dry for 5 minutes at ambient temperature. Apply transparent adhesive tape and leave for 15 seconds. Remove the tape slowly. Record the degrees of Print removal as nil, slight, severe. The grading is to be agreed between purchaser and supplier.

7.1.2 Ink adhesion of printed containers test — Procedure

Apply two strips of 25 mm wide transparent adhesive tape to the print area of each container, one piece down the length of the container, and the other around the circumference. The position should be varied from container to container, if possible, covering the whole print area in stages. Press the tape firmly on to the container with a thumb and leave for 15 seconds. Remove the tape by pulling slowly from the surface. Record the degree of Print removal as nil, slight, severe. The grading is to be agreed between the purchaser and the supplier.

Public Review Draft

 © EAC 2025 – All rights reserved

7.1.3 Electrostatic dust attraction test

7.1.3.1 Apparatus

The following apparatus shall be used:

a) A cabinet controlled to a relative humidity of 25 % ± 5 % at a temperature 27 oC±2 °C. The cabinet should be fitted with a side pipe for spraying dust, and a drawer, for holding a drying agent, connected with the cabinet by a sliding hatch.

b) **Carbon black dust** is suitable.

c) Carbon black dust sprayer.

d) Paper tissue.

7.1.3.2. Test specimens

The sample size shall be a minimum of 6 finished and printed containers for a single test.

7.1.3.3 Procedure

Containers to be handled by the neck only and should not be tested until 12 hours after production. Wipe out the test cabinet with a clean dry rag to remove dust from previous tests. Electrostatically charge the samples by rubbing with tissue both sides of each bottle 10 times in one direction only. Use a new tissue for each sample batch. Place the charged containers in the cabinet about 50 mm apart close the cabinet and its side pipe, and open the hatch connection between the cabinet and the drying drawer. Start circulating the fan and reduce the relative humidity to the required level. Switchoff fan and allow the containers to remain at the given relative humidity for 2 hours. Close the hatch and inject a 4-second burst of carbon black dust through the side pipe. Close the side pipe and run the fan for about 10 seconds to circulate the dust.

Remove the containers and lightly blow off the excess dust. Examine the containers for degree of electrostatic dust attraction and report the attraction as grade 1, 2, 3, 4 where one is the cleanest, 2, clean 3, slightly clean and 4 is dusty.

1 Cleanest

2 Clean

3 Slightly clean

4 Dusty

Public Review Draft

© EAC 2025 – All rights reserved

Annex A
(normative)
Method for measurement of container height to neck face

Ascertain the container height to neck face by placing the empty container on a flat surface and measuring to the highest point to the neck face. The measurement shall be to an accuracy of 0.02 mm.

Public Review Draft

© EAC 2025 – All rights reserved

Annex B
(normative)
Method for measurement of container diameter

Ascertain the external diameter of the container by either of the method indicated in (B.1) or (B.2) as follows:

B.1 Using a vernier or micrometer, measure the diameter of the empty container at an agreed height in the following positions:

(1) Close to, but avoiding the part line.

(2) At 90^{o} to the position stated in (1).

The measurement shall be to accuracy of 0.02 mm. Record diameter as the mean of the two diameters at right angles.

B.2 Using a circumference gauge, measure the circumference of the empty container at an agreed height. Record the diameter as the circumference multiplied by 0.318.

NOTE The circumference gauge normally gives the mean diameter directly

Public Review Draft

© EAC 2025 – All rights reserved

Annex C
(normative)

Method for measurement of container mass

Ascertain the container mass by weighing the empty container on a balance to an accuracy of 0.1g the accuracy of weighing shall be as follows

1. to the nearest 0.1 g for a container mass up to 50 g
2. to the nearest 0.5 g for a container mass over 50 g up to and including 200 g
3. to the nearest 1 g for a container mass over 200 g.

Public Review Draft

© EAC 2025 – All rights reserved

Annex D
(normative)
Vibration test

D.1 Apparatus

A vibrating table having a total displacement of 25 mm and frequency such that a specimen, when subjected to simple harmonic vertical vibration, just leaves the vibrating surface during each cycle.

NOTE The purchaser may require, *inter alia,* that containers suitable for multi-strip service be in accordance with the requirements of the transportation authority

D.2 Test specimens

Take a sample of containers at random as in 7.1.

D.3 Procedure

D.3.1 In the case of containers for liquids, fill the specimen to its nominal capacity with water at ambient temperature.

In the case of containers for substances other than liquids, use the commodity concerned to fill the container to approximately its nominal capacity with a fine sand and sawdust mixture having approximately the same bulk density as the commodity concerned, until the gross mass approximates, to within 2.5 %, the gross mass for which the container is intended.

D.3.2 Place the specimen on the vibrating table and, unless it is a non-invertible container, vibrate it for 5000 cycles while it is standing on its bottom, 5000 cycles while it is standing on its top and 5000 cycles while it is lying on its side.

In the case of non-invertible container, vibrate it for 10000 cycles while it is lying on its side.
D.3.4 Examine the specimen and its closures for damage and leakage.
Repeat the test on the other specimen.

Public Review Draft

© EAC 2025 – All rights reserved

Annex E
(normative)
Resistance to impact

E.1 Apparatus

a) A suitable sling having a quick-release hook and connected to a hoisting device, and mounted at a suitable height (see Table 4) centrally above (b) below.
b) A flat steel plate of thickness at least 12 mm, resting on a solid concrete floor and surrounded by suitable cushioning that will nullify any secondary impacts that may occur accidentally after the drop.

E.2 Test specimens

Use the containers tested in 8.2.

E.3 Procedure

a) Retain the loading as given in 3.2.2 (a). So fit the sling around one specimen that when the specimen is hanging freely the selected point of impact is lowest and a line passing through this point and the centre of gravity of the specimen is vertical to within 5. Position the cushioning material that, when the specimen falls over after the initial impact, it will strike a cushion. Hoist the specimen until the selected point of impact is over the steel plate at the appropriate height given in Table 4, and drop it. After each drop equalise the pressure inside the specimen with ambient pressure by partly opening a closure and closing it again and examine the specimen for leakage.

b) Drop each container six times, selecting the points of impact at, or as close as possible to (depending upon design features), the following positions:

i) Tight-head containers (other than non-invertible containers with a protruding neck).

1st impact: On a closure.

2nd impact: On the other closure or, if a second closure is not provided, on the junction of the top and body approximately 120o, away from the first point of impact.
4th, 5th, and 6th impacts: At positions approximately 120o, apart on the junction of the base and body.

ii) Open-head containers

1st, 2nd, and 3rd impacts: At positions approximately 120o apart on the junction of the lid and body top. 4th, 5th and 6th impacts: At positions approximately 120o, apart on the junction of the base and body.

iii) Non-invertible tight-head containers with a protruding neck

1st impact: On the closure.

2nd and 3rd impact: On the "top shoulder".
(in order to achieve impact at the selected positions, it may be necessary to drop the specimen onto a smooth, solid steel rail.)
4th, 5th, and 6th impacts: At positions approximately 120o apart on the junction of the base and body.

Public Review Draft

© EAC 2025 – All rights reserved

Annex F
(normative)
Air-leakage test

G.1 Apparatus

a) A bath of water in which a specimen float;
b) A suitable supply of compressed air;
c) A flexible hose having a pressure gauge and a pipe fitting that form a pressure-tight seal with an opening made in a specimen.
NOTE It is often convenient to drill a small hole through the centre of a closure and secure the fitting in such a way that the
normal sealing function of the closure is not impaired.

G.2 Test specimens
From the remainder of the sample (7. 1) take at random another sample as in 8.2 or 8.3 (i.e. do not use those used for the tests in 8.2 and 8.3).

G.3 Procedure
Connect the flexible hose to one specimen, float the specimen on the water in the bath, and apply the internal air pressure given in 5.4 so rotate the specimen that all portions are submerged (in turn) and examine for air leaks. Repeat the test on the other specimens.
NOTE Ensure that the operator is protected from possible rupture of the specimen.

Public Review Draft

© EAC 2025 – All rights reserved

Annex G
(normative)
Compression test/Stack load test

J.1 Principle

A force is applied to the top face of the package equivalent in magnitude to the total weight of identical packages stacked on top to a minimum stack height of 3 m. The duration is 24 h.

H.2 Sample Size

Four containers shall be used for each single test.

H.3 Procedure

H.3.1 Fill the containers with water at ambient temperature up to nominal capacity and close with the usual closure to the nominal torque (if the liquid to be packed is of high density, it should be used as the test medium).

H.3.2 Arrange the containers in a block at 2 x 2 on a rigid, level, flat surface. Apply a top load evenly distributed on a flat plate placed on the unsupported containers. The total superimposed load along with the load of the flat surface for different sizes of containers shall be as specified in the specifications of the individual container.

H.3.3 Examine the containers after 24 h of test period. The containers shall not show any cracks or permanent buckling likely to reduce their strength, cause leakage or reduction in effectiveness of the closure or cause instability in stacks.

Public Review Draft

© EAC 2025 – All rights reserved

Annex H
(normative)
Handle strength test

H.1 Apparatus

A hoisting device equipped with a quick-release hook and with two slings (each of width approximately 50 mm) that are strongly anchored and are adjustable to allow a free drop of 300 mm before the drop is arrested.

H.2 Test specimens

Use the containers that were used for the previous test (8.8).

H.3 Procedure

Load one specimen (with any suit- able material) to its intended gross mass, suspend it from the quick-release hook, and fit a sling to the handle or to each of the handles, as relevant.
Adjust the sling(s) to allow a free fall of 300 mm, ensuring that, if the specimen has two handles, it is so positioned that both handles will be subjected to the same force when the slings arrest the drop.
By releasing the quick-release mechanism, drop the specimen three times and observe the condition of the handle(s) at the end of each drop. Repeat the test on the other specimens.

Public Review Draft

© EAC 2025 – All rights reserved

Annex I
(normative)
Compatibility test

I.1 Method A

I.1.1 Apparatus

I.1.1.1 A heated cabinet; maintained at a temperature of 40 °C ± 2 °C and suitably ventilated to dispose of fumes.

I.1.1.2 A balance; accurate to 1 mg or better.

I.1.1.3 A micrometer accurate to 0.01 mm or better and suitable for measuring the thickness of plastics materials.

I.1.1.4 A pair of callipers accurate to 0,01 mm or better.

I.1.1.5 A tensile strength testing machine.

I.1.2 Test specimens

From each of the two containers used for the previous test (8.9) cut four dumb-bell shaped test specimens for tensile strength determination, and three rectangular test specimens of approximately equal size and each having a surface area of at least 1500 mm2, ensuring that all the specimens are cut from stress-free areas where the least variation in thickness occurs.

I.1.3 Procedure

i) Determine, to the nearest milligram, the mass of the six rectangular test specimens and determine the length, width, and thickness of each to the nearest 0.02 mm. Note the position where each measurement is taken.
ii) Suspend in a glass vessel the six rectangular test specimens and two of the dumb-bell shaped test specimens from each container and add enough of the commodity for which the plastics containers are intended to cover all the specimens. Ensure that the specimens are hanging free in the commodity and, if necessary, attach small mass pieces to prevent the specimens from floating. Close the vessel.
iii) In the case of food products expose the test specimens to the relevant food product at ambient temperature for a period equal to the shelf life of the food product.
iv) After (in all cases) wiping each specimen clean with a dry tissue,
1) determine the mass of each rectangular specimen, and measure its dimensions in the same positions as before; and
2) determine, the percentage elongation of break of the two untreated and the two treated dumb-bell specimens from each container.
vi) Visually examine the specimens for blisters and embrittlement and both the specimens and the commodity in which they were suspended for changes in colour.

Public Review Draft

© EAC 2025 – All rights reserved

I.2 Method B

I.2.1 Test specimens

The sample taken in accordance with 7. 1.

I.2.2 Procedure

Fill the containers to their nominal capacity with the commodity for which they are intended, close them in the normal manner, and store them at room temperature in the normal free-standing position for a period of 6 months and inspect them regularly for signs of failure.
At the end of the test period remove the contents and subject the containers to the following tests, using a different container for each test:
a) Impact test at ambient temperature (8.3).
b) Impact test at 27 oC± 2 oC (8.6).
c) Air leakage test (8.4).
d) Compression test (8.9).

Public Review Draft

© EAC 2025 – All rights reserved

Annex J
Environmental stress cracking test

N.1 Apparatus

a) A water bath filled with a solution that contains 2 % (m/v) of the active agent of a suitable anionic detergent in water, and maintained at a temperature of 565 °C± 30 °C.

b) A supply of compressed air that can be regulated and maintained at a gauge pressure of 20 KPa ± 5 KPa.

c) A flexible hose fitted with a suitably calibrated pressure gauge and a fitting that forms a pressuretight seal with an opening made in a specimen.

N.2 Test specimens

Use the containers that were used for the previous test (3.4).

N.3 Procedure

Test each specimen as follows:

a) Remove the closure(s) and completely fill the specimen with the heated solution, e.g. by submerging it in the water bath. Do not seal it. Leave it submerged, together with its closure(s), in the water bath for a period of 24 hours.

b) At the end of the exposure period, empty the specimen to 20 KPa for 10 min and check for leaks and cracks in high stress areas.

Public Review Draft

© EAC 2025 – All rights reserved

Annex K
(normative)
Closure test (non-vented closures)

K.1 Filling medium

If the specimens are intended for a low viscosity liquid, use the liquid for which they are intended, and if they are intended for a solid, granular, or powdered commodity, or for a liquid having a higher viscosity than that of water at ambient temperature, use water.

K.2 Test specimens

Take the sample in accordance with (7.1).

K.3 Procedure

Fill one specimen to its nominal capacity with the appropriate filling medium. In the case of a tighthead container, place the specimen on its side with a closure at the lowest position and leave it for one hour. When relevant, repeat this procedure for the other closures.
In the case of an open-head container specimen, place the tightening device on the clamping ring or strap in the lowest position and leave for one hour.
After each test period carefully examine the closure under test for signs of leakage. Repeat the test on the other specimens.

Public Review Draft

© EAC 2025 – All rights reserved

Annex L
Environmental stress cracking test

L.1 Apparatus

a) A water bath filled with a solution that contains 2 % (m/v) of the active agent of a suitable anionic detergent in water, and maintained at a temperature of 565 °C± 30 °C.

b) A supply of compressed air that can be regulated and maintained at a gauge pressure of 20 KPa ± 5 KPa.

c) A flexible hose fitted with a suitably calibrated pressure gauge and a fitting that forms a pressure tight seal with an opening made in a specimen.

L.2 Test specimens

Use the containers that were used for the previous test (3.4).

L.3 Procedure

Test each specimen as follows:

a) Remove the closure(s) and completely fill the specimen with the heated solution, e.g. by submerging it in the water bath. Do not seal it. Leave it submerged, together with its closure(s), in the water bath for a period of 24 hours.

b) At the end of the exposure period, empty the specimen to 20 KPa for 10 min and check for leaks and cracks in high stress areas.

Public Review Draft

© EAC 2025 – All rights reserved

Annex M
Tensile strength and elongation at break

M.1 Apparatus

M.1.1 Tensile testing machine

A tensile strength testing machine of the self-aligning type and of a suitable, size and design to break the test specimens under a tensile load. The speed of the moving jaw shall be 51 ± 13 mm per minute. The apparatus should be equipped with an indicator that records the maximum load reached during the test and with removable jaws suitable for clamping dum-bell test specimens.

M.1.2 Die

A steel die to cut out test specimens of the following dimensions:
Overall length, min ---------- 246 mm
Length of narrow section ---------- 67 mm ± 0.5 mm
Overall width ---------- 19 mm ± 0.5 mm
Width of narrow section---------- 12.5 mm ± 0.5 mm
Radius of fillet, min ----------75 mm
The cutting edges shall be sharp and free from nicks.

M.1.3 Measuring device, a metrological measuring device A.

M.1.4 Rule

A steel rule of suitable length and graduated in 1mm divisions.

M.2 Test specimens

From each sample cut 6 test pieces (sections) each of length 300 mm. Cut the test pieces along the direction of flow of the pipe and heat the test pieces to a temperature not above 150 °C, split them longitudinally, flatten them, and immediately cut (with the die) dumb-bell specimen from each flattened test piece. Condition the dumb-bells. Without damaging the specimen, carefully draw (on each specimen) two reference lines 20 ± 1 mm apart, perpendicular to the longitudinal direction and approximately equidistant from the mid-point of the narrow section of the specimen.

M.3 Procedure

Using the measuring device, measure the thickness and width of the narrow section of each dumbbell specimen to the nearest 0.01 mm. So clamp the ends of a dumb-bell specimen in the jaws of the testing machine that the distance between the jaws is 130 ± 15mm. Operate the machine until the specimen ruptures. Measure the distance between reference lines during the elongation of the specimen. Note the maximum load applied and the distance between the reference lines at rapture. Repeat the test on the remaining 4 dumb-bell specimens.

M.4 Calculations

M.4.1 Tensile strength

Calculate the cross-sectional area of each test specimen from the dimensions of its narrow section. Then calculate the tensile strength of each test specimen as follows:

Tensile strength, MPa = Cross sectional area mm2
Maximum load applied N
Record the average of the 5 results as the tensile strength of the sample.

M.4.2 Elongation at break

Calculate the elongation at break of each test specimen as follows:
Elongation break % 100

$$\text{Elongation break } \% = \frac{L - L_0}{L_0} \times 100$$

Public Review Draft

© EAC 2025 – All rights reserved

where
L = distance between the reference lines at rapture, mm
*L*o = original distance between the reference lines, mm
Record the average of the 5 results as the elongation at break of the sample.

Public Review Draft

© EAC 2025 – All rights reserved

Annex N
(informative)
Notice to Purchasers

The information in the appendices is additional to that in the specification and has been included purely for information and guidance.

N.1 The following requirements must be specified in tender invitations and in each order or contract:

a) The colour of the container (see 3. 1).
b) When relevant, that the container(s) shall have a minimum lifespan (see 3.1).
c) The style (see 4.1).
d) In the case of tight-head containers, the number, types, and sizes of closures (see 4.1(a)).
e) In the case of open-head containers and when relevant, that a gasket for the lid-to-body joint, or closures or both are required, and the number, types, and sizes of closures (see 4.1).
f) When relevant, that handles are required and the type and number on (see 4.2).
g) The shape and dimensions (see 4.3).

N.2 The following requirements must be agreed upon between the supplier and the purchaser:

a) When relevant, the minimum lifespan of the container(s) (see 3. 1).
b) The nominal mass (see 4.5).
c) The method of test to be used to assess compatibility with the relevant commodity (see NOTE in 5.8).
d) The nominal capacity (see 4.4).
e) Any additional marking required (see 6. 1 (0).

Public Review Draft

© EAC 2025 – All rights reserved

Annex O
Informative
Measurement of Wall Thickness

O.1 Apparatus

O.1.1 Micrometer/screw gauge,

fitted with ball point tips or dial calliper gauge fitted with spherical anvils giving an accuracy of measurement of 0.02 mm.

O.1.2 Procedure

The container wall thickness shall be ascertained by either of the methods indicated below or any other applicable method.

O.1.3 Micrometer method

Cut the container 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.

O.1.4 Dial calliper gauge method

Measure the wall thickness with the help of dial calliper fitted with spherical anvils, Care shall be taken to avoid movement of the container 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.

Public Review Draft

© EAC 2025 – All rights reserved

Bibliography

BS 5638-1, *Blow moulded unplasticised PVC containers — Part 1: Specification for containers up to 5 litres capacity*

BS 4839-1, *Blow moulded polyolefin in containers*

SABS 533, *Black polyethylene pipes for cold-water services*

SABS 1176, *Self-supporting containers for plastics material and of nominal capacities 5-220 litres*

Public Review Draft

© EAC 2025 – All rights reserved

Public Review Draft

© EAC 2025 – All rights reserved

Public Review Draft

© EAC 2025 – All rights reserved

Public Review Draft

© EAC 2025 – All rights reserved

Public Review Draft

© EAC 2025 – All rights reserved

Public Review Draft

© EAC 2025 – All rights reserved