



DRAFT TANZANIA STANDARD

GDC 4 (1074) DTZS Packaging - Steel drums - Part 2: Non-removable head drums-Specification

TANZANIA BUREAU OF STANDARDS

EXECUTIVE SUMMARY OF GDC 4 (1074) DTZS PACKAGING — STEEL DRUMS — PART 2: NON-REMOVABLE HEAD DRUMS-SPECIFICATION

This draft Tanzania standard specifies the requirements, methods of sampling and testing for non-removable head drums or tight head drums, manufactured from galvanized or ungalvanized steel sheet.

It is anticipated that this draft Tanzania Standard will be made **COMPULSORY** in its application.

NATIONAL FOREWORDS

0.1 The Tanzania Bureau of Standards is the statutory national standards body for Tanzania, established under the Act.No.3 of 1975, amended by Act.No.2 of 2009.

This draft Tanzania Standard has been adopted by Packaging Technical committee, under the supervision of the General Techniques Standards Divisional Committee (GTDC) and it is in accordance with the procedures of the Bureau.

During preparation of this standard, assistance was drawn from the following document:

IS 2552 Steel drums (galvanized and ungalvanized) – Specification

ISO 15750 Packaging — Steel drums —Part 1: Removable head (open head) drums with a minimum total capacity of 208 L, 210 L and 216.5 L

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

0.2 Terminology and conventions

Some terminology and certain conventions are not identical with those used as Tanzania Standard; attention is drawn to the following:

The comma has been used as decimal marker for metric dimensions. In Tanzania, its current practice to use a full point on the baseline as decimal marker.

Whenever the words “International Standard” appear, referring to this draft Tanzania Standard, they should read as “Tanzania Standard”.

1. Scope

This draft Tanzania standard specifies the requirements, methods of sampling and testing for non-removable head drums or tight head drums, manufactured from galvanized or ungalvanized steel sheet.

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 3574:2012 Cold-reduced carbon steel sheet of commercial and drawing qualities

ISO 3573:2012 Hot-rolled carbon steel sheet of commercial and drawing qualities

ISO 228-1:2000 Pipe threads where pressure-tight joints are not made on the threads — part 1: dimensions, tolerances and designation

ISO 15750-3:2002 Packaging — Steel drums — part 3: inserted flange-type closure systems

3. Terms and definitions

For the purpose of this document, the following terms and definitions shall 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 chimb

projecting edge rim or brim at the ends of a drum. Also used to refer to the depth of the end stamping of a drum

3.2 drum

cylindrical packaging made of steel, the ends of which are permanently fixed to the body, with openings for filling, emptying and venting in the head

3.3 round seam

seam consisting of six or more layers of steel

3.4 nominal capacity

capacity, in litres, which by convention is used to represent a class of drums of similar brimful capacities

3.5 total capacity

volume of water, in litres, held by the drum when filled completely, i.e. following the removal of any air trapped in the drum, the drum being closed and having a lid fitted with closures

3.6 strap handle

handle formed of strip metal with cranked ends, riveted, soldered or welded to the head of the container

4. Materials

4.1 Body and ends shall be of steel sheet CR1 (commercial quality) for cold-reduced steel, according to ISO 3574, or of steel sheet HR1 (commercial quality) for hot-rolled steel according to ISO 3573. Steel of higher strength is permitted.

4.2 Closure flanges shall be manufactured from metal, and closure plugs from metal or plastic materials.

5. Requirements

5.1 General requirements

5.1.1 Construction

5.1.1.1 Body and heads shall be constructed of steel of adequate thickness in relation to the intended use.

5.1.1.2 The longitudinal seam of the body shall be welded.

5.1.1.3 The body and ends shall be permanently fixed by round seaming as shown in Figure 1, details A and B, using a non-hardening seaming compound, or other joining methods (e.g., welding).

5.1.1.4 Two rolling hoops (beads) expanded or rolled into the body shall be located as shown in Figure 1.

5.1.1.5 Constructions of rolling hoops other than those shown are allowed and the drum body may be reinforced with corrugations.

NOTE: The preferred drum type is the drum with two rolling hoops only.

5.1.1.6 The closures shall be positioned in the top end, diametrically opposed as indicated in Figure 1.

5.1.1.7 The nominal pitch diameter and pitch of the closures shall be as defined in ISO 228-1, threads G 3/4 and G 2.

5.1.1.8 The closures should be as specified in ISO 15750-3, unless otherwise agreed between the purchaser and manufacturer.

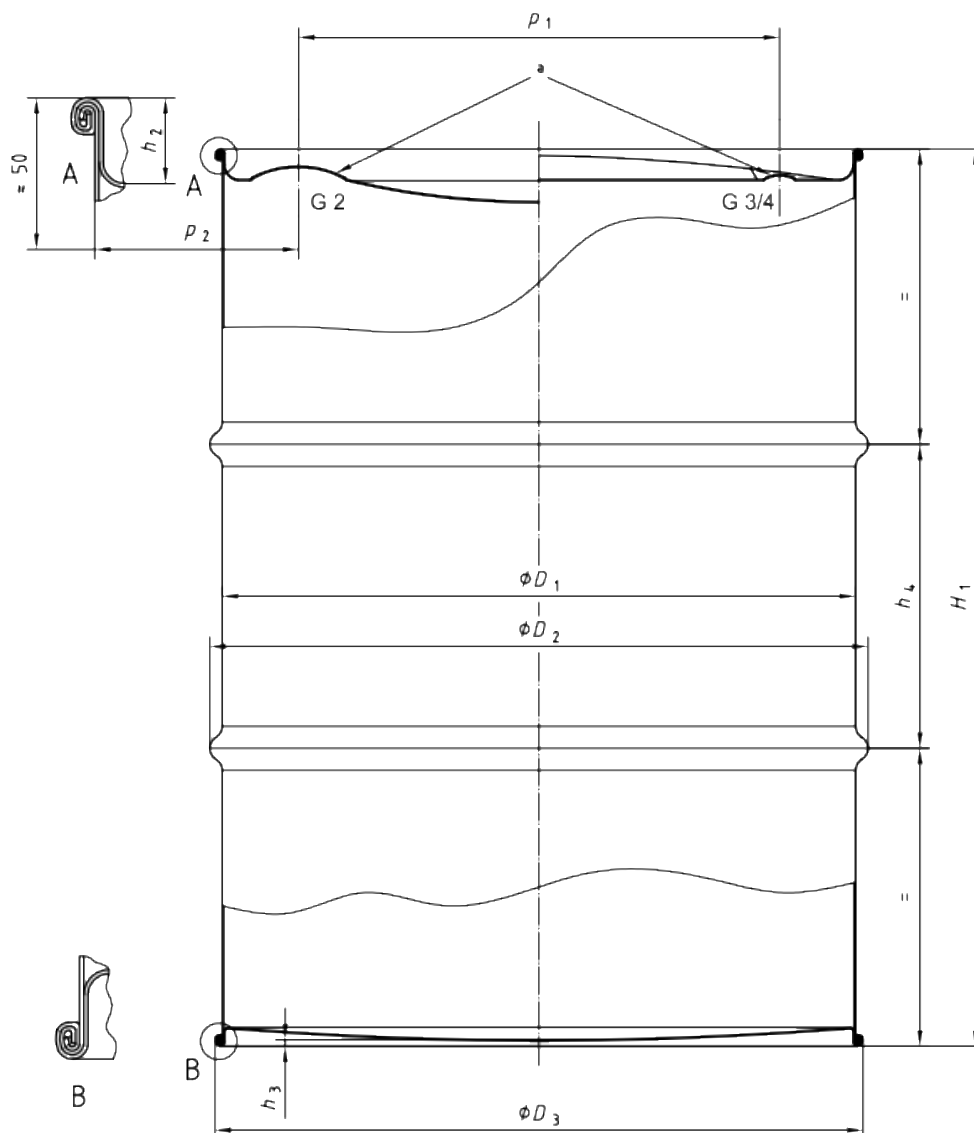
5.1.1.9 Gaskets/washers or other sealing elements shall be used with the closures unless the fittings are inherently leakproof.

5.1.1.10 The metal or plastic plugs shall be fitted with washers/gaskets of suitable materials.

5.1.1.11 The nature of the internal and external finish shall be agreed between the purchaser and manufacturer.

5.1.1.12 If materials used for the body, heads and fittings are not in themselves compatible with the contents to be transported, suitable internal protective coatings or treatments shall be applied. These coatings or treatments shall retain their protective properties under normal conditions of transport.

Dimensions in millimetres



NOTE Figure 1 shows three possibilities for the shape of the top: convex, flat and concave.

^a The complete closure (plug and capseals/overseals) shall not protrude above the top of the seam.

Figure 1 — Non-removable head (tight head) drum

D₁- Internal diameter

D₂- External diameter

D₃- Diameter over chime

H₁- Total drum height

p₁- Centre-to-centre distance of closures

p₂- Location of G2 (50 mm) closure to outside body, measured approximately 50 mm from top

h₂- Depth of top

h₃- Clearance from floor

h₄- Distance between beads

5.2 Specific requirements

5.2.1 Drop impact strength

The drum shall show no sign of rupture or leakage when tested in accordance with the method described in Annex A.

5.2.2 Internal air pressure

The drum when subjected to an internal air pressure of 40 kPa shall show no leakage when tested in accordance with the method described in Annex B.

5.2.3 Handle pull strength

The handle of the drum shall show no permanent distortion or damage on the handle retaining lugs or rivets or welding on the handle seat when tested in accordance with the method described in Annex C.

5.2.4 Thickness

5.2.4.1 Thickness of the steel sheet

The thickness of the sheet metal used for the body and the ends shall be between 0.6 mm and 1.6 mm, with tolerances according to ISO 3573 or ISO 3574.

5.2.4.2 Thickness of the handle

The minimum nominal sheet thickness of the strap handle shall be 0.5 mm, and the wire thickness of the wire handle shall be 5 mm.

5.2.5 Draining

The design of the drum shall be such as to minimize the residual volume of the liquid left in the drum after drainage. The residue shall not be more than 100 ml when tested according to procedure A of Annex D or not more than that agreed between the purchaser and supplier when tested in accordance with procedure B of Annex D.

NOTE: The residue according to procedure B is more dependent on the area and condition of the internal surface of the packaging than procedure A and therefore may be in excess of that for procedure A.

6. Marking

The drums shall be marked indelibly or embossed with the following information on top or bottom ends:

- a) Manufacture's name or identification mark.
- b) Year of manufacture.
- c) Nominal capacity.
- d) Use /or use restrictions e.g., for chemicals only, food safe, not for corrosive materials etc.

7. Sampling

7.1 The drum shall be type tested for the requirements given in clauses 5.2.1, 5.2.2, 5.2.3 ,5.2.4 and 5.2.5. Any change in design, material or capacity makes it necessary for the new drums to be tested in accordance with all the tests specified.

7.2 The frequency of sampling and the number of samples are deemed to the matter of agreement between the purchaser and supplier. Nevertheless, the sample size given in the test methods namely, drop impact, handle strength and internal pressure shall be used as these are the minimum necessary to obtain meaningful test results regardless of the batch size under consideration.

Annex A

(Clause 5.2.1)

Drop Impact Test

- A1.** The drums shall be subjected to the drop tests detailed in A2 and A3.
- A2.** Fill the drum to 98 percent of its total capacity with water, close the drum properly and keep its diagonal in a vertical position. Drop the drum four times from a height of one metre on a concrete floor, drops arranged in such a manner that the following four points of the drum strike the floor on each drop-in turn:
- a) The bottom rim near its junction with the side seam;
 - b) The top rim near its junction with the side seam;
 - c) The bottom rim diametrically opposite to the position at (a);
and
 - d) The top rim diametrically opposite to the Position at (b).
- A3.** Empty the drum after the conclusion of the four drops. The drum shall not show any sign of leakage.

Annex B

(Clause 5.2.2)

Air Pressure Test

B1. The drums shall be subjected to the drop tests detailed in B2 and B3.

B2. The drum when required for packing liquid products, shall be subjected to an internal air pressure of 40 kPa while fully immersed under water or coated over with soap water.

B3. The drum shall show no sign of leakage.

Annex C

(Clause 5.2.3)

Handle Pull Test

C1. The handle of the drum shall be subjected to the gradual pull as given below, distributed uniformly over the length of the handle for a period of two minutes.

Nominal Capacity	Pull load,kg
Up to 10 Litres	30
Above 10 Litres	72

C2. After removal of the load, no permanent distortion or damage shall be observed on the handle retaining lugs or rivets or welding on the handle seat.

Annex D

(Clause 5.2.5)

Draining test

D.1. Principle

The method of determining absolute and relative drainability relies on obtaining the mass of water left as a residue in the drum after drainage under gravity.

D.2. Apparatus

A weighing scale with an accuracy of at least ± 2 g is required.

D.3. Procedures

Procedure A

Using the top section of the drum, cut the drum in half.

Retain the top half and fit the appropriate closure(s).

Weigh the top half with closures fitted, and record the mass, m_1 , in grams.

Position the drum half, top down, on a test rig so that it is held at the angle specified by the manufacturer (preferably 0° to 20°) with the designated closure opening at its lowest position.

Fill the top with approximately 10 L of tap water. Wait until the water surface has settled and then open the closure.

Allow the water to drain for 5 min without moving or shaking the top then refit the closure.

Reweigh the drum top, still in the top-down position, and record the mass, m_2 , in grams.

Procedure B

Using a complete drum, weigh the empty drum including its closure(s), and record its mass, m_1 , in grams.

Fill the drum with a limited quantity of tap water, approximately 10 L. Close the drum.

Rotate the drum to ensure a wetting of all inner surfaces.

Open the drum and place it in a horizontal position with the designated closure opening in its lowest position and leave it till the liquid flow stops. (See Figure D.1, Position 1.) Slowly incline the drum up to the manufacturer's recommended angle which ensures the optimal draining (preferably 0° to 20°) and leave the drum in this position for 5 min (Position 2), without moving or shaking the drum.

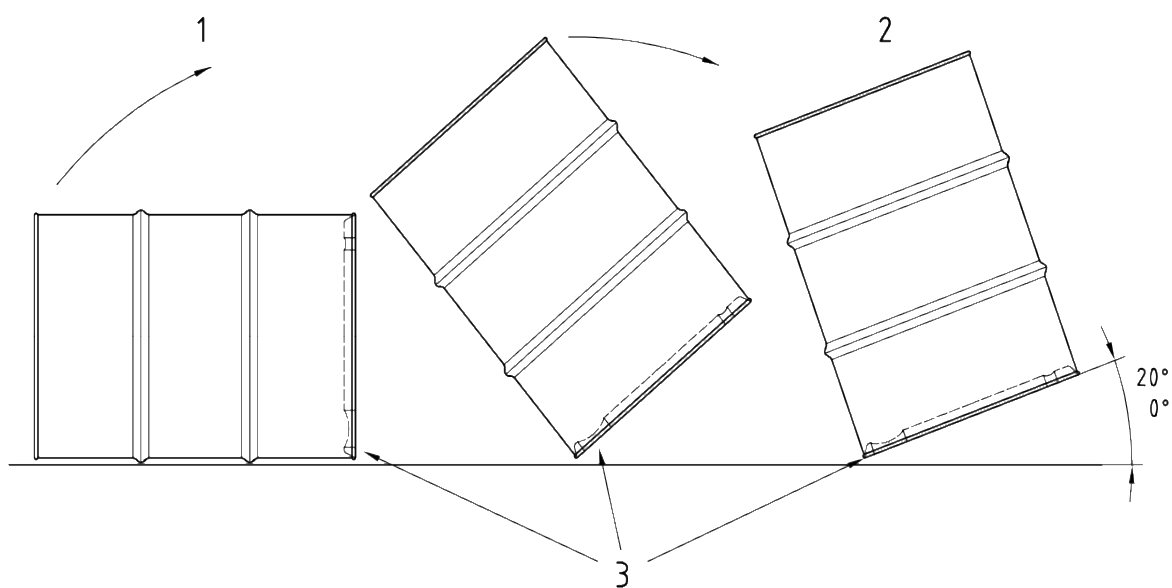
Fit and secure the designated closure and remove any surplus water from the outside.

Weigh the emptied drum, and record its mass, m_2 , in grams.

D.4. Expression of results

The difference between the weighing ($m_2 - m_1$) represents the residue in the drum and is called the absolute drainability of the drum.

The relative drainability of a drum is calculated as its absolute drainability expressed as a percentage of the total capacity.



Key

1. Position 1
2. Position 2
3. Designated closure

Figure D.1 -Draining of the Drum