INTERNATIONAL STANDARD

ISO 15750-1

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Packaging — Steel drums —

Part 1: Removable head (open head) drums with a minimum total capacity of 208 l, 210 l and 216,5 l

Emballages — Fûts en acier —

Partie 1: Fûts à ouverture totale d'une capacité totale minimale de 208 l, 210 l et 216,5 l

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 15750 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15750-1 was prepared by Technical Committee ISO/TC 122, *Packaging*.

ISO 15750 consists of the following parts, under the general title *Packaging — Steel drums*:

— *Part 1: Removable head (open head) drums with a minimum total capacity of 208 l, 210 l and 216,5 l*

— *Part 2: Non-removable head (tight head) drums with a minimum total capacity of 212 l, 216,5 l and 230 l*

— *Part 3: Inserted flange-type closure systems*

Annex A forms a normative part of this part of ISO 15750.

Introduction

Throughout the world a large number of steel drum types with different dimensions and characteristics are being used. The differences in location of the filling opening and outer dimensions result in differences in filling, handling and transportation.

This part of ISO 15750 gives uniform specifications for four main types of drums for use in international trade and the preferred target option is drum type A (see Table 1).

It specifies the characteristics and dimensions of steel drums which are of importance for the exchangeability, and does not give detailed performance requirements and related test methods. The performance requirements depend on the specific application.

Where the drums are intended to be used for the transport of dangerous goods, attention is drawn to the regulatory requirements which govern the transport of those goods in the countries concerned, including capseals/overseals fitted in accordance with the certificate. Depending upon the mode of transport, this means meeting the requirements of:

— UN (United Nations): *Recommendations on the transport of dangerous goods. Model regulations*;

— ICAO (International Civil Aviation Organization): *Technical Instructions for safe transport of dangerous goods by air*;

— IMO (International Maritime Organization): *International Maritime Dangerous Goods (IMDG) Code*.

This involves the certification and marking of the drums according to the regulations.

Packaging — Steel drums —

Part 1:
Removable head (open head) drums with a minimum total capacity of 208 l, 210 l and 216,5 l

1 Scope

This part of ISO 15750 specifies the characteristics and dimensions of removable head (open head) drums, manufactured from steel sheet, having a total capacity of 208 l, 210 l and 216,5 l.

It also specifies a method for measuring the total and brimful capacity.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 15750. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 15750 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 3573:1986, *Hot-rolled carbon steel sheet of commercial and drawing qualities*

ISO 3574:1986, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 15750-3, *Packaging — Steel drums — Part 3: Inserted flange-type closure systems*

3 Terms and definitions

For the purposes of this part of ISO 15750, the following terms and definitions apply.

3.1
removable head (open head) drum
OH
cylindrical packaging made of steel, the bottom end of which is permanently fixed to the body and the top end can be removed as a lid and closed by means of a closing ring

NOTE The top end may have additional openings for filling and venting.

3.2
round seam
seam consisting of six or more layers of steel

3.3
nominal capacity
capacity, in litres, which by convention is used to represent a class of drums of similar brimful capacities

3.4
brimful capacity
volume of water, in litres, held by the drum when filled through the fitted filling orifice to the point of overflowing, the drum being closed and having a lid fitted with closures

NOTE Annex A specifies the measuring method.

3.5
total capacity
TC
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

NOTE Annex A specifies the measuring method.

4 Dimensions

The dimensions of the drum shall be as shown in Figure 1 and detailed in Table 1 for drum type A, B, C or D.

The steel thickness shall be between 0,6 mm and 1,6 mm, with tolerances according to ISO 3573 or ISO 3574 (normal tolerances).

5 Material

Body and ends shall be of steel sheet CR1 (commercial quality) for cold-reduced steel, according to ISO 3574:1986, or of steel sheet HR1 (commercial quality) for hot-rolled steel according to ISO 3573:1986. Steel of higher strength is permitted.

Closure flanges shall be manufactured from metal, and closure plugs from metal or plastics material.

6 Construction

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

6.2 The longitudinal seam of the body shall be welded.

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

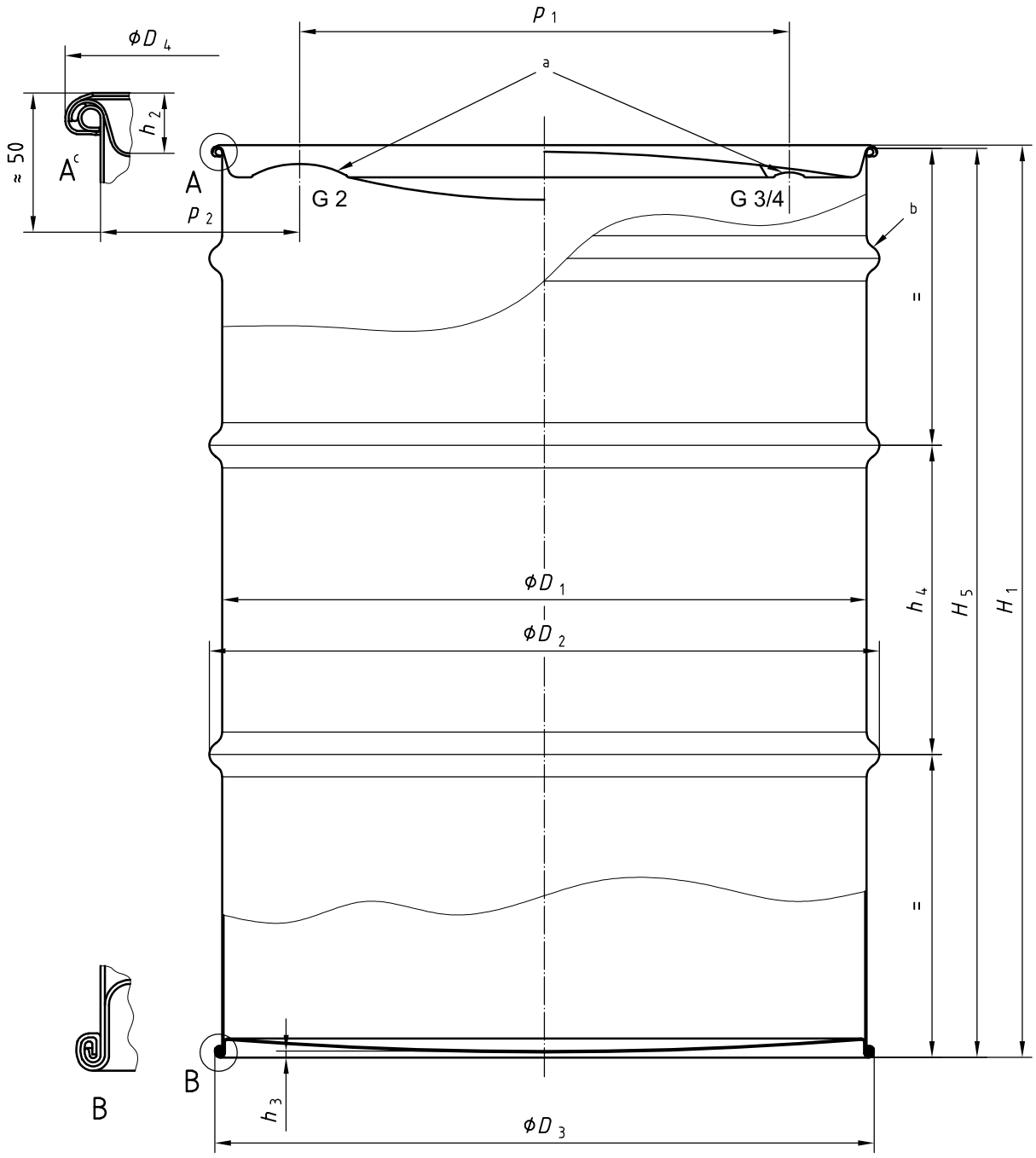
6.4 Two rolling hoops (beads) expanded or rolled into the body shall be located as shown in Figure 1. Constructions of rolling hoops other than those shown are allowed including a third rolling hoop (bead), or replacement of the beads by small corrugations.

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

6.5 The removable top end shall be fitted with a gasket of suitable material.

6.6 The construction of the closing ring shall be such that the tightness of the drum is not jeopardized.

Dimensions in millimetres



a Closures (optional).

b Third bead is optional.

c Detail of drum type B + D.

Figure 1 — Removable head (open head) drum

Table 1 — Dimensions of removable head (open head) steel drums

Dimensions in millimetres

Dimension (see Figure 1)	Description	Drum Type A		Drum Type B		Drum Type C	Drum Type D
	Total capacity	210 l min.	216,5 l min.	210 l min.	216,5 l min.	208 l min.	208 l min.
D_1	Internal diameter	571,5 ± 2	571,5 ± 2	571,5 ± 2	571,5 ± 2	566 ± 2	566 ± 2
D_2	External diameter over rolling hoops	585 max.	585 max.	596 max.	596 max.	585 max.	585 max.
D_3	Diameter over bottom chime	585 max.	585 max.	593 max.	593 max.	585 max.	585 max.
D_4	Diameter over closing ring	585 max[a]	585 max.[a]	610 max.	610 max.	585 max.[a]	620 max.
H_1	Total drum height	878 ± 5	888 ± 5	878 ± 5	888 ± 5	890 ± 5	890 ± 5
H_5	Height with cover off	868 ± 5	878 ± 5	868 ± 5	878 ± 5	880 ± 5	880 ± 5
h_2	Depth of top	b	b	b	b	b	b
h_3	Clearance from floor	4 min.	4 min.	4 min.	4 min.	4 min.	4 min.
h_4	Distance between beads	280 ± 3	280 ± 3	280 ± 3	280 ± 3	300 ± 3	300 ± 3
p_1	Centre-to-centre distance of closures	c	c	c	c	c	c
p_2	Location of G2 (50 mm) closure to outside body, measured approximately 50 mm from the top	72 ± 3	72 ± 3	72 ± 3	72 ± 3	94 ± 3	94 ± 3

The total capacity shall be as indicated when measured in accordance with annex A.

Closures are optional. If closures are fitted, the insertion of the closure with the G2 thread according to ISO 15750-3 shall be such that its centreline is as close as possible to the vertical.

NOTE 1 Of the four drum types shown, types A and C have the optimal outside dimensions required for stacking drums four abreast in ISO containers as per ISO 668:1995, *Series 1 freight containers — Classification, dimensions and ratings*.

NOTE 2 For types A and C, the diameter D_4 is achieved by modification of the top construction. The two approaches in use are as follows.

a) Reduction of the drum whereby the closing system (curl, cover, closing ring) maintains the same dimensions as in use for type B and type D. The required inside diameter of the reduced top part of the drum is in this case approx. 545 mm for type A and 536 mm for type C.

b) Changing of the closing system (curl, cover and closing ring) so that, while maintaining the inside diameter at 571,5 mm for type A and 566 mm for type C, the total outside diameter is kept within 585 mm.

[a] The diameter over the closing ring shall normally be a maximum of 585 mm but may be slightly larger if measured over the lever section or bolt section of the ring.

[b] If the lid is fitted with closures, the depth of the top shall be such that the closures do not protrude above the closing ring.

[c] For the centre to centre distance of the closures the dimensions shall be:

— drum type A and B: 444 mm ± 6 mm or 451 mm ± 1 mm;

— drum type C and D: 400 mm ± 6 mm.

6.7 If additional closures are provided in the top end, the following applies.

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

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

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

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

e) The metal or plastics plugs shall be fitted with washers/gaskets of suitable material.

7 Finish

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

7.2 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.

8 Designation

A removable head (open head) drum manufactured to this part of ISO 15750 shall be designated as follows:

Open head steel drum ISO 15750-1-(total capacity)TC-Type

EXAMPLES

Open head steel drum ISO 15750-1-216,5TC-A

Open head steel drum ISO 15750-1-208TC-D

Open head steel drum ISO 15750-1-208TC-C

Open head steel drum ISO 15750-1-210TC-B

Annex A
(normative)

Capacity measurement method for removable head (open head) drums

A.1 Principle

The capacity is determined by a gravimetric method; i.e. by measurement of the mass of water in the packaging and its conversion to a capacity. A correction factor may be applied according to Table A.1, but only if the weighing scale used is of a higher precision than the correction.

For both methods at least a G 2 closure shall be fitted in the lid and this is the closure referred to in the procedures.

Table A.1 — Temperature-dependent correction factor

Water temperature °C	Correction factor F
12	1,000 5
14	1,000 8
16	1,001 1
18	1,001 4
20	1,001 8
22	1,002 2
24	1,002 7
26	1,003 3
28	1,003 8
30	1,004 4

A.2 Apparatus

The accuracy of the weighing scale shall be at least 0,1 % of the mass being measured.

A.3 Procedure

A.3.1 Determination of the total capacity

Drill a hole of diameter 5 mm to 10 mm for venting at the highest point of the closed drum. The position of the hole depends on the profile of the top.

Weigh the empty drum and record its mass, m_1, in grams.

Use tap water and measure its temperature.

Fill the drum with water through the G 2 filling closure with all other closures secured and make sure that the air can vent through the drilled hole. Fill the drum 100 %. The filling hole shall be at the highest position.

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

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

A.3.2 Determination of the brimful capacity

The sequence is identical to the total capacity with the exception that no hole is drilled to vent entrapped air.

Fill the drum with the drum in the normal position for filling until water overflows at the G 2 closure.

A.4 Expression of results

The difference between the weighings ($m_2 - m_1$), if necessary multiplied with the correction factor (F), represents the capacity of the drum as determined by the procedure used

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