BRITISH STANDARD

BS EN ISO
15750-2:2008

Packaging — Steel drums —

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

ICS 55.140

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN ISO 15750-2:2008. It is identical with ISO 15750-2:2002. It supersedes BS ISO 15750-2:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PKW/5, Primary and transport packaging.

A list of organizations represented on this committee can be obtained on request to its secretary.

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30 November 2008	This corrigendum renumbers BS ISO 15750-2:2002 as BS EN ISO 15750-2:2008

EUROPEAN STANDARD

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English Version

Packaging - Steel drums - Part 2: Non-removable head (tight head) drums with a minimum total capacity of 212 l, 216,5 l and 230 l (ISO 15750-2:2002)

Emballages - Fûts en acier - Partie 2: Fûts à ouverture partielle d'une capacité totale minimale de 212 l, 216,5 l et 230 l (ISO 15750-2:2002)

Verpackung - Stahlfässer - Teil 2: Spundfässer mit einem Gesamtvolumen von mindestens 212 l, 216,5 l und 230 l (ISO 15750-2:2002)

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Foreword

The text of ISO 15750-2:2002 has been prepared by Technical Committee ISO/TC 122 “Packaging” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15750-2:2008 by Technical Committee CEN/TC 261 “Packaging” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by December 2008.

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Endorsement notice

The text of ISO 15750-2:2002 has been approved by CEN as a EN ISO 15750-2:2008 without any modification.

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 three 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.

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Packaging — Steel drums —

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

1 Scope

This part of ISO 15750 specifies the characteristics and dimensions of non-removable head (tight head) drums, manufactured from steel sheet, having a total capacity of 212 l, 216,5 l and 230 l.

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

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
non-removable head (tight head) drum
TH
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

3.2
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 designed filling orifice to the point of overflowing

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

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 or C.

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 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).

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 and the drum body may be reinforced with corrugations.

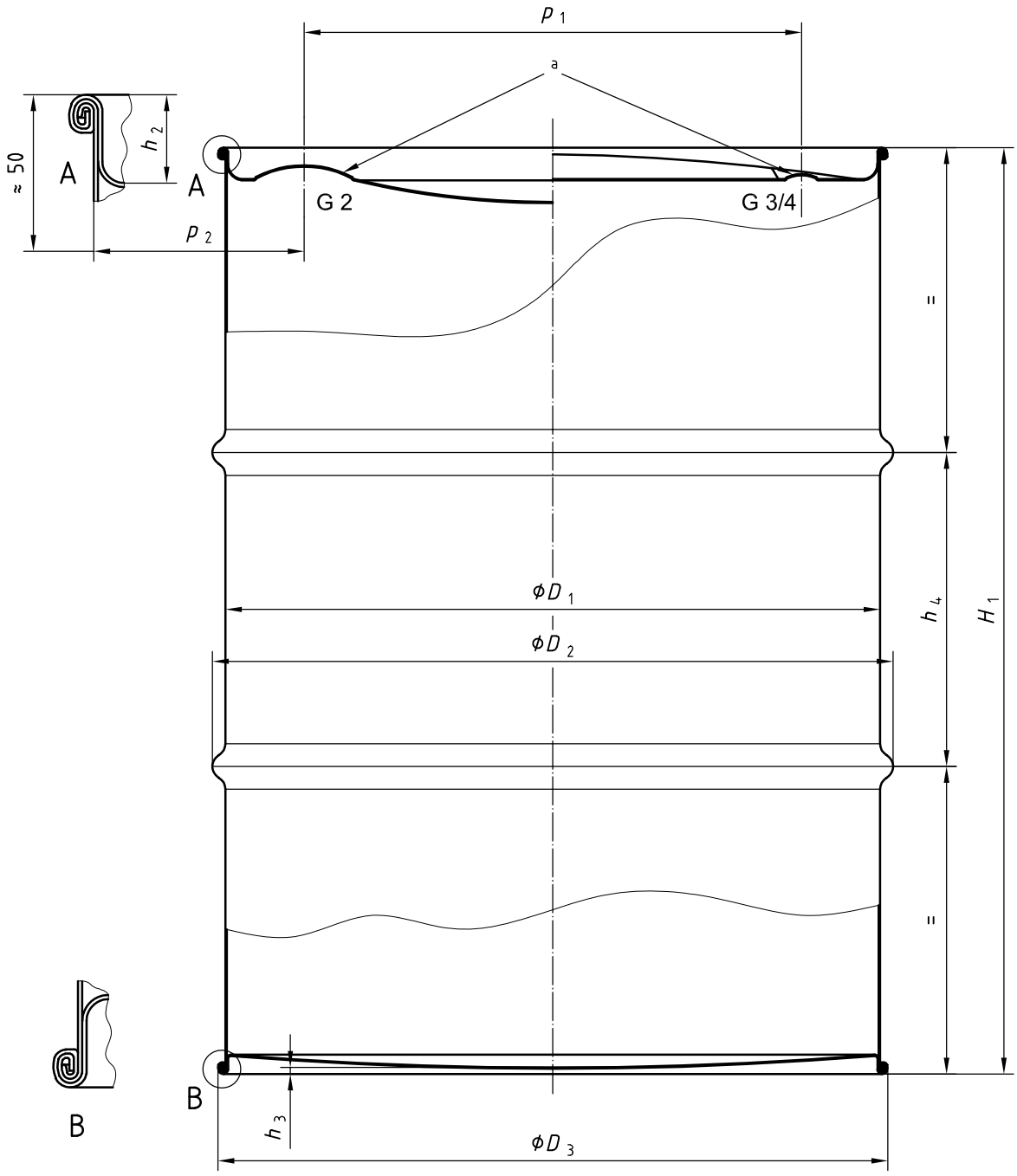
NOTE The preferred drum type is the drum with two rolling hoops only.

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

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

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

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

Table 1 — Dimensions of non-removable head (tight head) steel drums

Dimensions in millimetres

Dimension (see Figure 1)	Description	Drum Type A		Drum Type B		Drum Type C
	Total capacity	216,5 l min.	230 l min.	216,5 l min.	230 l min.	212 l min.
D_1	Internal diameter	571,5 ± 2	571,5 ± 2	571,5 ± 2	571,5 ± 2	566 ± 2
D_2	External diameter	585 max.	585 max.	596 max.	596 max.	585 max.
D_3	Diameter over chimb	585 max.	585 max.	593 max.	593 max.	585 max.
H_1	Total drum height	878 ± 5	932 ± 5	878 ± 5	932 ± 5	890 ± 5
h_2	Depth of top	a	a	a	a	a
h_3	Clearance from floor	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
p_1	Centre-to-centre distance closures	b	b	b	b	b
p_2	Location of G 2 (50 mm) closure to outside body, measured approximately 50 mm from the top	72 ± 3	72 ± 3	72 ± 3	72 ± 3	94 ± 3

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

The insertion of the closure with the G 2 thread according to ISO 15750-3 shall be such that its centreline is as close as possible to the vertical.

NOTE 1 For drums produced with a concave top, the total drum height H_1 may be increased by 4 mm in order to reach the specified volume.

NOTE 2 Of the three drum types shown, types A and C have the optimal outside diameter required for stacking drums four abreast in ISO containers as per ISO 668:1995, *Series 1 freight containers — Classification, dimensions and ratings*.

a The depth of the top shall be such that the closures do not protrude above the chime.

b For the centre-to-centre distance the dimensions shall be:

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

— drum type C: 400 mm ± 6 mm.

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

6.9 The metal or plastic 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 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 be not more than 100 ml when tested according to procedure A of annex B, or not more than that agreed between the purchaser and supplier when tested in accordance with procedure B of annex B.

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.

9 Designation

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

Tight head steel drum ISO 15750-2-(total capacity)TC-Type

EXAMPLES

Tight head steel drum ISO 15750-2-216,5TC-A

Tight head steel drum ISO 15750-2-230TC-B

Tight head steel drum ISO 15750-2-212TC-C

Annex A
(normative)

Capacity measurement method for non-removable head (tight head) drums

A.1 Principle

The capacity is determined by a gravimetric method; i.e. by the 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.

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 normal filling closure with all other closures fitted 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 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.

Annex B
(normative)

Draining test method for non-removable head (tight head) drums

B.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.

B.2 Apparatus

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

B.3 Procedures

B.3.1 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.

B.3.2 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.

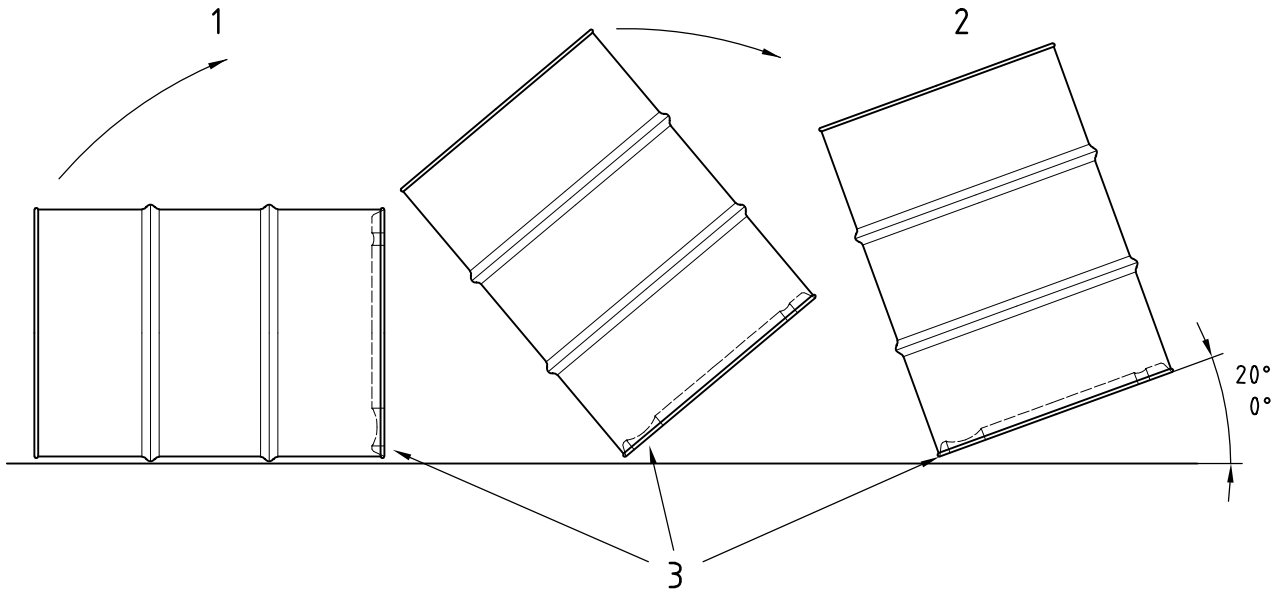
Rotate the drum to ensure a wetting of all inner surfaces.

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 B.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.



Key

1 Position 1
2 Position 2
3 Designated closure

Figure B.1 — Draining of the drum

B.4 Expression of results

The difference between the weighings $(m_2 - m_1)$ 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.

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