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Packaging — Plastics drums —

Part 2: Non-removable head (tight head) drums with a nominal capacity of 208,2 l and 220 l

Emballages — Fûts en matière plastique —

Partie 2: Fûts à ouverture partielle d'une capacité nominale de 208,2 l et 220 l

ICS 55.140

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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 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 20848-2 was prepared by Technical Committee ISO/TC 122, *Packaging*.

ISO 20848 consists of the following parts, under the general title *Plastics drums*:

- *Part 1: Removable head (open head) drums with a nominal capacity of 113,6 l to 220 l*
- *Part 2: Non-removable head (tight head) drums with a nominal capacity of 208,2 l and 220 l*
- *Part 3: Plug/bung closure systems for plastics drums with a nominal capacity of 113,6 l to 220 l*

Annexes A, B and C form normative parts of this part of ISO 20848.

Annexes D, E and F form informative parts of this part of ISO 20848 and will be deleted in the final ISO standard (for further information – see Introduction).

Introduction

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

This standard specifies the characteristics and dimensions of plastics drums which are of importance for the worldwide safe handling and transport of substances and for the continued reuse of the drums during their life cycle. Detailed performance requirements and the related test methods are not included as they depend upon the specific application.

The members of ISO/TC 122/WG 8 would like to have a nation related overview on the present status and opinions on preferred target options for tight head (plastics) drums with a nominal capacity of 208,2 l and 220 l and their closure systems. WG 8 would like to propose "preferred target options" on dimensions for drums and closures in the final ISO standard. For this reason the WG members prepared the questionnaires in Annexes D to F and would like to ask the members of ISO/TC 122 to complete them and return them together with the voting form for this DIS. The Annexes with the questionnaires will be deleted in the final ISO standard.

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 caps/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.
- **ICAO** (International Civil Aviation Organisation) – Technical Instructions for the safe transport of dangerous goods by air.
- **IMO** (International Maritime Organisation) – International Maritime Dangerous Goods (IMDG) Code

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

Packaging — Plastics drums —

Part 2:

Non-removable head (tight head) drums with a nominal capacity of 208,2 l and 220 l

1 Scope

This International Standard specifies the characteristics and dimensions of non-removable head (tight head) plastics drums with a nominal capacity of 208,2 l and 220 l.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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/CD 20848-3, *Plastics drums - Part 3, Plug/bung closure systems for plastics drums with a nominal capacity of 113,6 l to 220 l*

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3 Terms and definitions

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

3.1

non-removable head (tight head) drum (TH)

flat-ended or convex-ended circular cross-section packaging with openings for filling and emptying in the head not exceeding 70 mm in diameter

3.2

nominal capacity (NC)

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

3.3

brimful capacity (BC)

volume of water in litres held by the drum when filled through the filling orifice to the point of overflowing

NOTE Annex A (normative) specifies the method for measuring brimful capacity.

3.4

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 (normative) specifies the method for measuring total capacity.

3.5

overall height (h_o)

height of the finished drum from the base to the highest point (see figure 1)

3.6

overall diameter (d_o)

maximum diameter of the drum, where relevant (see figure 1)

3.7

bung housing position (p_b)

distance from the centre of the bung housing to the outside of the drum body 50 mm vertically below the top edge of the top handling ring (see figure 1)

3.8

drum mass

mass of the empty drum including all closures

4 Requirements

4.1 Dimensions

The dimensions and tolerances of the drum shall be as listed in Table 1 and as shown in Figure 1. The measurements shall be conducted at ambient conditions but shall not be made within 48 h of manufacture.

NOTE Apart from the dimensions specified, there are no restrictions on drum shape.

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Table 1 — Dimensions of non-removable (tight head) drums with a nominal capacity of 208,2 l and 220 l (55 US gal and 58,1 US gal)

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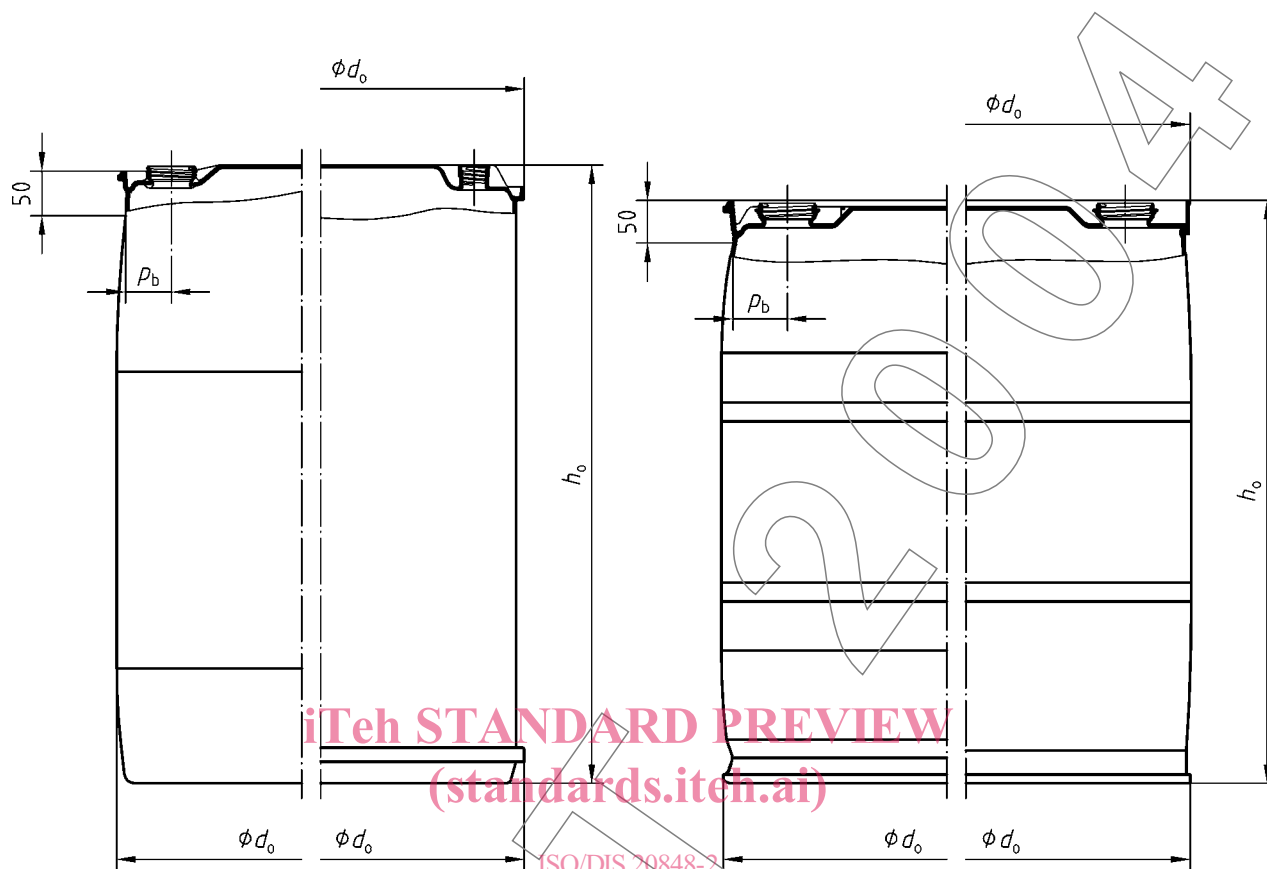
Nominal capacity (NC) l – US gal	Brimful capacity (BC) l – US gal	Overall diameter (d_o) mm	Bung housing position (p_b) mm	Overall height (h_o) mm
208,2 l (55 US gal)	216,5 l +5/-0 (57,2 US gal +1,32/-0)	595 +5/-7	84 ± 2	890 ± 7
220 l (58,1 US gal)	222 l +3/-2 (58,6 US gal +0,8/-0,5)	581 ± 5	72 ± 2	935 ± 5

NOTE 1 The bung housing position defined in this table only applies to that housing used for filling.

NOTE 2 Dimensions d_o , p_b and h_o are applicable to empty drums.

NOTE 3 1 US gal = 3,785 l

Dimensions in millimetres



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Key

- p_b bung housing position
- d_o overall diameter
- h_o overall height

NOTE 1 Figure 1 shows four possible designs.

NOTE 2 The complete closure (plug and capseals/overseals) should not protrude above the overall height h_o .

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

4.2 Drum mass

The mass tolerance of the drum shall be within $\pm 3\%$.

NOTE The defined mass should be agreed between the purchaser and the supplier.

4.3 Material identification symbol

The drum shall be permanently marked with the relevant material identification symbol, i.e. the symbol identifying the material from which the drum is made as shown in Annex C.

4.4 Closures

There shall be two closures in accordance with ISO/CD 20848-3. When fitted the closures shall not protrude above the overall height of the drum.

The closure systems shall incorporate a facility for providing tamper evidence.

NOTE 1 For the purpose of transport and storage, the filled drum should be closed, using the appropriate tooling, to the manufacturer's recommended closure torque for each type of gasket.

NOTE 2 For closures in drums destined for dangerous goods the tolerance on the torque figures are specified in ISO 16104.

NOTE 3 After tightening of plugs, torques will reduce over time. In particular, plastics components are subject to stress relaxation resulting in a reduced torque.

NOTE 4 Torque figures supplied by the manufacturer are valid for the tightening of plugs in a clockwise direction. The measurement of torques on releasing plugs, i.e. in an anticlockwise direction are different.

4.5 Materials

The drum shall be manufactured from high density polyethylene or another suitable plastics material, or a combination thereof. Suitable non-plastics material may be used in conjunction with the plastics material.

NOTE Suitable additives may be included provided the specifications are identified.

4.6 Handling

Provision shall be made to enable the drum to be mechanically handled using one or two permanently fixed handling rings. The construction of the handling rings shall be adequate for normal static and dynamic handling of filled drums.

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4.7 Stacking

The drum shall be capable of being stacked with or without pallets, according to the manufacturer's recommendations.

4.8 Draining

4.8.1 The drum shall be designed so as to minimize the residual volume of liquid left in the drum after drainage. The residue shall be not more than 100 ml when tested according to Annex B (procedure B.3).

4.8.2 The residue obtained when the drum is tested according to Annex B (procedure B.4) is more dependent on the area and condition of the internal surface of the drum than procedure B.3 and therefore may be in excess of that for procedure B.3.

NOTE The maximum permitted figure should be agreed between the purchaser and the supplier.

4.9 Finish

The external surface finish shall be suitable for the attachment of labels.

NOTE 1 The nature of the internal and external finish should be agreed between the purchaser and the supplier.

NOTE 2 The preferred colour option for the drum body is blue. The use of any other colour and any durable marking should be agreed between the purchaser and the supplier.

5 Designation

A non-removable head (tight head) drum (TH) manufactured in accordance with this standard with a nominal capacity of 220 l shall be designated:

For example

Plastics drum TH ISO 20848-2 NC-220 l

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Annex A (normative)

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

A.1 Principle

The capacity is determined by a gravimetric method i.e. by the measurement of the mass of water in the filled drum and its conversion to a capacity. A correction factor can 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 — Correction factors

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
27	1,0036

A.2 Apparatus

A.2.1 Weighing scale, with an accuracy of at least 0,1 % of the weight being measured.

A.3 Procedure for determination of total capacity

A.3.1 Drill a hole of diameter 5 mm to 10 mm for venting at the highest point of the closed drum.

NOTE The position of the hole depends on the profile of the top.

A.3.2 Weigh the empty drum and record its mass, m_1 , in grams.

A.3.3 Measure the temperature of the tap water to be used to fill the drum.

A.3.4 Fill the drum 100 % with water through the normal filling closure with all other closures fitted and make sure that the air is vented through the drilled hole.