INTERNATIONAL STANDARD

ISO 20848-1

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Packaging — Plastics drums —

Part 1: Removable head (open head) drums with a nominal capacity of 113,6 l to 220 l

Emballages — Fûts en matière plastique —

Partie 1: Fûts à ouverture totale d'une capacité nominale de 113,6 l à 220 l

Reference number
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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 20848-1 was prepared by Technical Committee ISO/TC 122, *Packaging*.

ISO 20848 consists of the following parts, under the general title *Packaging — 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*

Introduction

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

ISO 20848 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.

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*,

— **ICAO** (International Civil Aviation Organization) — *Technical Instructions for the 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 — Plastics drums —

Part 1: Removable head (open head) drums with a nominal capacity of 113,6 l to 220 l

1 Scope

This part of ISO 20848 specifies the characteristics and dimensions of removable head (open head) plastics drums with a nominal capacity of 113,6 l to 220 l.

2 Normative references

The following referenced documents are indispensable for the application 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 20848-3, *Packaging — Plastics drums — Part 3: Plug/bung closure systems for plastics drums with a nominal capacity of 113,6 l to 220 l*

3 Terms and definitions

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

3.1
removable head (open head) drum
OH
flat-ended or convex-ended circular cross-section packaging, the top end of which can be removed as a lid and is closed by means of a closing ring or other device

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 specifies the method for measuring brimful capacity.

3.4
total capacity
TC
volume of water in litres held by the drum, with its lid on, when filled completely, i.e. following the removal of any air trapped in the drum

NOTE Annex A specifies the method for measuring total capacity.

3.5
overall height, h_o
height of the finished drum, including the lid with closing ring secured, from the base to the highest point

NOTE See Figure 1.

3.6
overall diameter, d_o
maximum diameter of the drum, where relevant

NOTE See Figure 1.

3.7
minimum opening, d_m
minimum drum body opening size

NOTE 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.

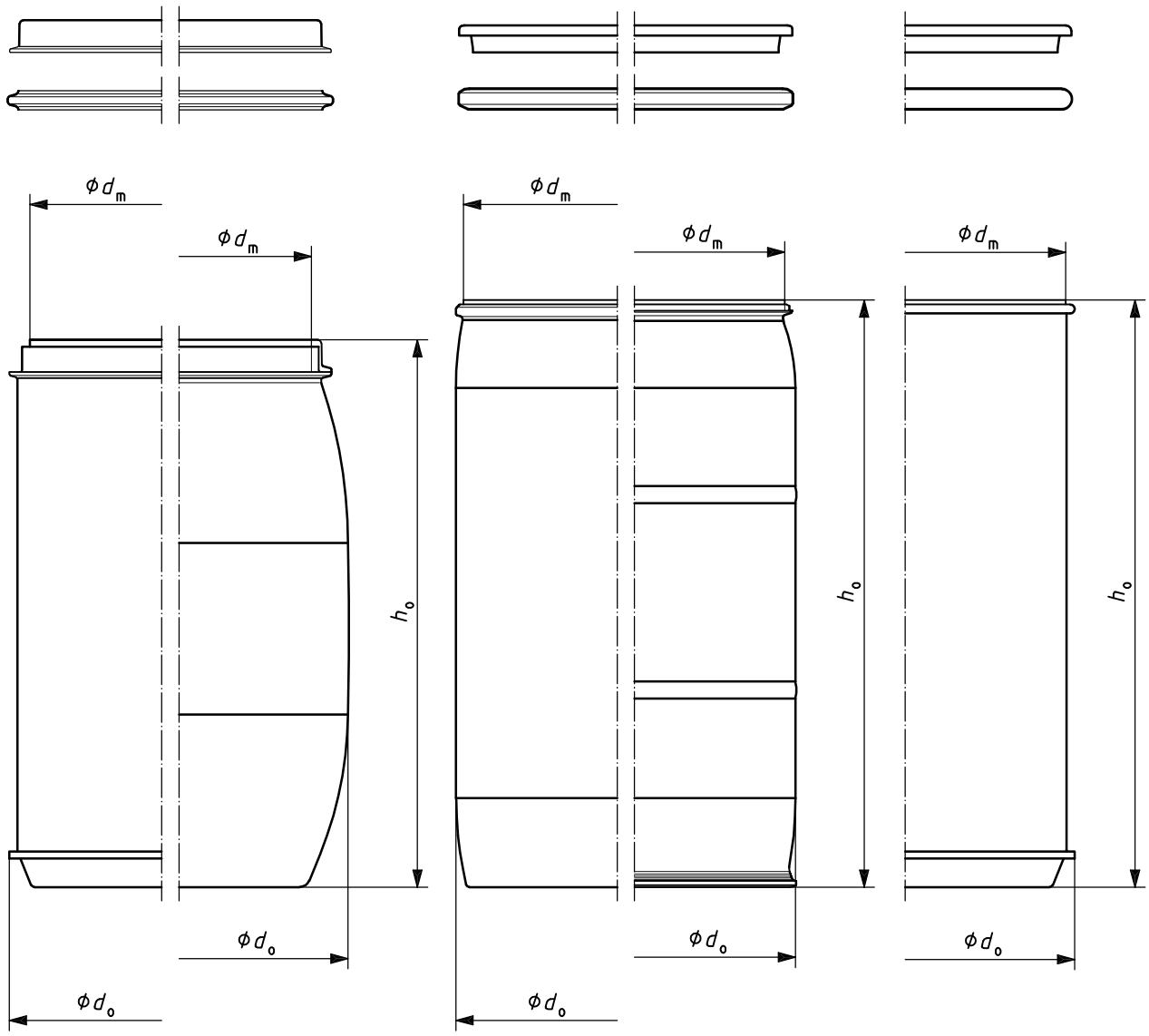
NOTE Apart from the dimensions specified, there are no restrictions on drum shape.

Table 1 — Dimensions of removable (open head) drums with a nominal capacity of 113,6 l to 220 l (30 US gal to 58,1 US gal)

Nominal capacity, NC l (US gal)	**Minimum total capacity**, TC l (US gal)	**Overall diameter**, d_o mm	**Minimum opening**, d_m mm	**Overall height**, h_o mm
113,6 (30)	118,1 (31,2)	480 ± 10 [a]	450 ± 10 [a]	745 ± 10 [a]
120 (31,7)	125 (33)	495 ± 5	380	805 ± 10 [a]
132,5 (35)	137,8 (36,4)	480 ± 10 [a]	450 ± 10 [a]	850 ± 10 [a]
150 (39,6)	155 (41)	500 ± 10	380	965 ± 10 [a]
208,2 (55)	216,5 (57,2)	575 ± 10 [a]	545 ± 10 [a]	900 ± 10 [a]
220 (58,1)	224 (59,2)	581 ± 5	380	935 ± 10 [a]
220 (58,1)	224 (59,2)	595 ± 5	380	985 ± 10 [a]

NOTE 1 Dimensions d_o, d_m and h_o are applicable to empty drums.
NOTE 2 1 US gal = 3,785 l.

[a] It is intended that these tolerances may be reduced to ± 5 mm after the five-year review period.



Key

d_o overall diameter

d_m minimum opening

h_o overall height (with lid on and closing ring secured)

Figure 1 — Removable head (open head) drum

4.2 Drum mass

The mass tolerance of the drum shall be ± 3 %.

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

4.3 Material identification symbol

All the plastics components, excluding gaskets, shall be permanently marked with the relevant material identification symbol, i.e. the symbol identifying the material from which the component is made, as shown in Annex B.

4.4 Closures

The closure system shall consist of a lid and a closing ring or other device.

For the purpose of transport and storage, the filled drum should be closed to the manufacturer's recommendations.

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

In addition, closure(s) according to ISO 20848-3 should be fitted in the lid.

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.

The means of handling shall be adequate for normal handling of the drum.

4.7 Stacking

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

4.8 Finish

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

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

The drum body should be blue in colour. The use of any other colour and any durable marking should be agreed between the purchaser and the supplier.

5 Designation

A removable head (open head) drum (OH) manufactured in accordance with this part of ISO 20848 with a nominal capacity of 220 l shall be so designated, e.g.

Plastics drum OH ISO 20848-1 NC - 220 l

Annex A
(normative)

Capacity measurement method for removable head (open 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	1,003 6

A.2 Apparatus

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 For removable head (open head) drums, place the lid, fitted with a closure for filling purposes, on the drum and close it using the recommended method.

A.3.2 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.3.3 Weigh the empty drum and record its mass, m_1, in grams.

A.3.4 Measure the temperature of the tap water to be used to fill the drum.

A.3.5 Fill the drum 100 % with water through the filling opening and make sure that air is vented through the drilled hole.

NOTE For certain drums, the drum needs to be inclined or tilted, so that the filling hole is at the highest position.

A.3.6 Fit and secure the drum closure and remove any surplus water from the outside.

A.3.7 Weigh the filled drum and record its mass, m_2, in grams.

A.4 Procedure for determination of brimful capacity

Follow the same procedure as for the determination of total capacity (see A.3) 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.5 Expression of results

The difference between the mass of the filled drum, m_2, and the mass of the empty drum, m_1, $(m_2 - m_1)$, if necessary multiplied by the correction factor F, represents the capacity of the drum as determined by the procedure used.

Annex B
(normative)

International material code symbols

Figure B.1 — Polyethylene terephthalate (PET)

Figure B.2 — Polyethylene, high density (PE-HD)

Figure B.3 — Vinyl (polyvinyl chloride or PVC)

Figure B.4 — Polyethylene, low density (PE-LD)

Figure B.5 — Polypropylene (PP)

Figure B.6 — Polystyrene (PS)

Figure B.7 — Other

ICS 55.140

Price based on 8 pages