INTERNATIONAL STANDARD

ISO 90-1

Second edition
1997-07-01

Light gauge metal containers — Definitions and determination of dimensions and capacities —

Part 1:
Open-top cans

Récipients métalliques légers — Définitions et détermination des dimensions et des capacités —

Partie 1: Boîtes serties

Reference number
ISO 90-1:1997(E)

Contents

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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.

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.

International Standard ISO 90-1 was prepared by Technical Committee ISO/TC 52, *Light gauge metal containers*, Subcommittee SC 4, *Open-top containers*.

This second edition cancels and replaces the first edition (ISO 90-1:1986), which has been technically revised.

ISO 90 consists of the following parts, under the general title *Light gauge metal containers — Definitions and determination of dimensions and capacities:*

— *Part 1: Open-top cans*

— *Part 2: General use containers*

— *Part 3: Aerosol cans*

Annexes A, B and C of this part of ISO 90 are for information only.

Introduction

ISO 90 consists of three parts which group definitions, methods for determination of dimensions and capacities, as well as tolerances and designations of rigid containers made of metal with a maximum nominal material thickness of 0,49 mm.

This part of ISO 90 covers open-top cans as defined in 2.1 and is applicable to both round and non-round cans.

Diameters for round open-top cans (beverage cans excluded) are specified in ISO 1361.

Light gauge metal containers — Definitions and determination of dimensions and capacities —

Part 1:
Open-top cans

1 Scope

This part of ISO 90 defines open-top cans and can types, cross-sections, constructions, shapes, special features and capacities of such cans. It specifies methods for determining cross-sections and gross-lidded capacities. It also specifies tolerances on capacity and recommends an international designation.

2 Definitions

For the purposes of this part of ISO 90, the following definitions apply.

2.1 Open-top cans

2.1.1 open-top can: Rigid container made of light gauge metal with a maximum nominal material thickness of 0,49 mm, one end of which is double-seamed after filling [see figure 6 a)].

2.1.2 open-top can for processed food products: Open-top can, tight to liquids and gases, preventing contamination of the contents by microorganisms after processing.

2.1.3 open-top can for beverages: Open-top can for liquid products to which gas is added during filling.

2.1.4 diaphragmed can: Can having a double-seamed diaphragm ring at the top end and a plug which fits into the ring [see figure 6 b)].

2.1.5 can with easy-open end for food and beverages: Can having one end comprised of a sheet metal wall with a line of scoring forming a tear strip or area and having a tab attached to the tear strip or area for easy manual severance thereof.

2.2 Cross-sections

2.2.1 round can: Can with a circular cross-section (see figure 1).

2.2.2 non-round cans

2.2.2.1 rectangular can: Can with a rectangular [see figure 2 a)] or square [see figure 2 b)] cross-section.

2.2.2.2 obround can: Can with a cross-section of parallel sides of equal length joined by two curved ends, which may be semicircular [see figure 3 a)] or include different radii [see figure 3 b)].

2.2.2.3 oval can: Can with an oval cross-section (see figure 4).

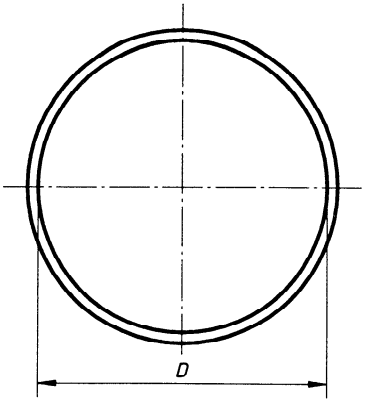
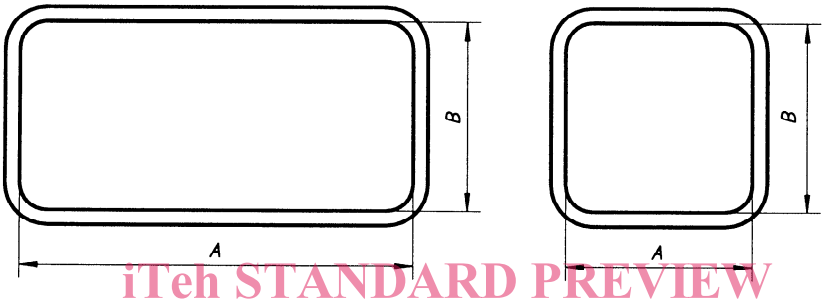


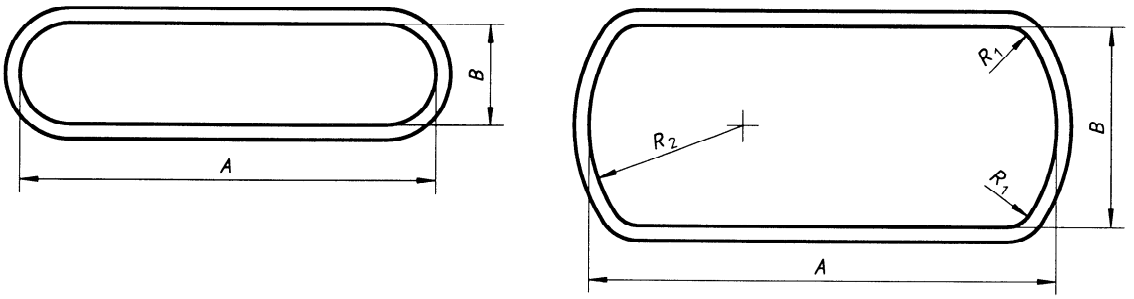
Figure 1 — Round can



a) Rectangular cross-section

b) Square cross-section

Figure 2 — Rectangular cans



a) Semicircular ends

b) Ends of different radii

Figure 3 — Obround cans

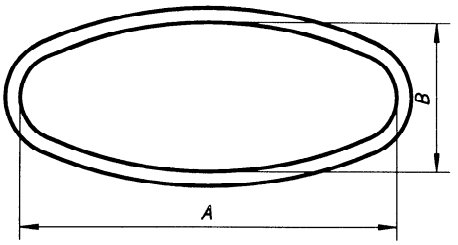


Figure 4 — Oval can

2.2.2.4 trapezoidal can: Can with an approximately trapezoidal cross-section with rounded corners (see figure 5).

NOTE — The shorter of the parallel sides [see figure 5 b)] may be curved.

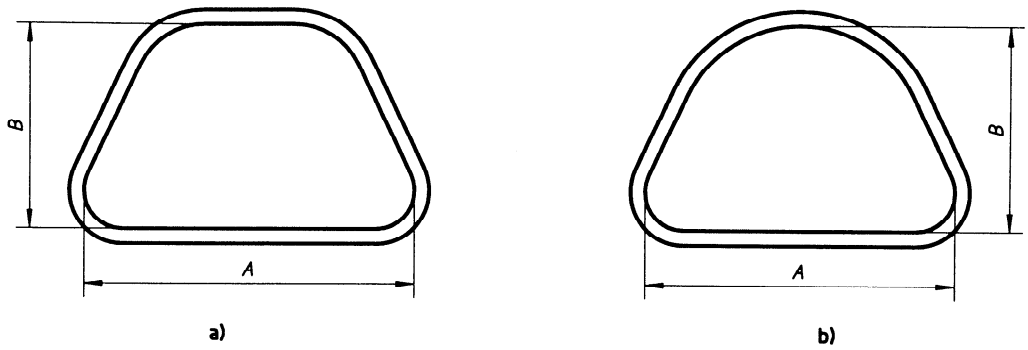


Figure 5 — Trapezoidal cans

NOTE — Some variations of the trapezoidal can are also known as pear-shaped cans.

2.3 Constructions

NOTE — Figures 6 and 7 apply to both round and non-round cross-sections.

2.3.1 three-piece can: Can made from three main components: body, top end and bottom end (see figure 6).

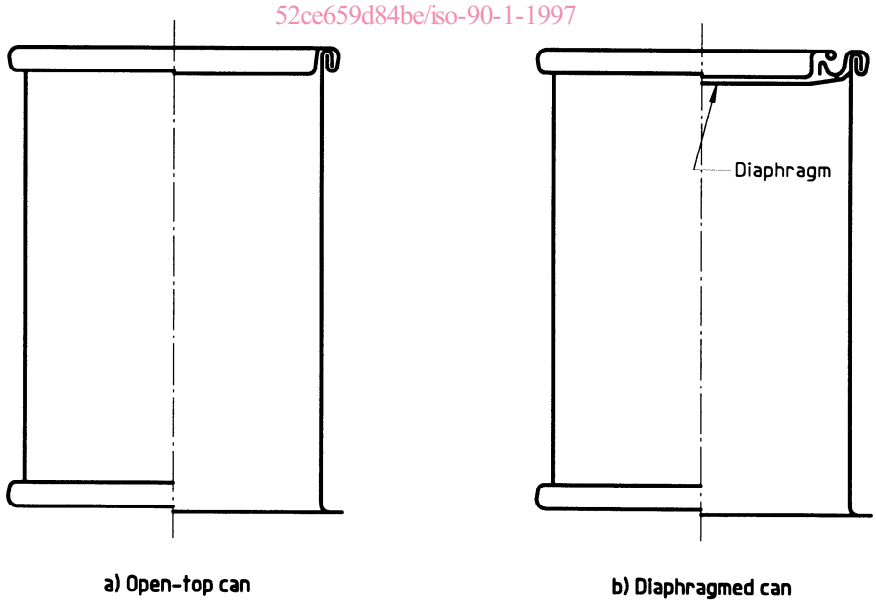


Figure 6 — Three-piece cans

2.3.2 two-piece can: Can made from two main components: body and bottom, which form one piece, and a top end (see figure 7).

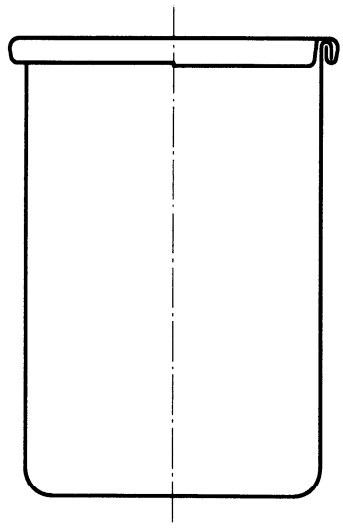


Figure 7 — Two-piece can

2.4 Shapes

NOTE — Figures 8 and 9 apply to both round and non-round cross-sections.

2.4.1 cylindrical can: Can which has cross-section of constant dimension from top to bottom, local variations caused by special features such as beading, etc. being disregarded (see figure 8).

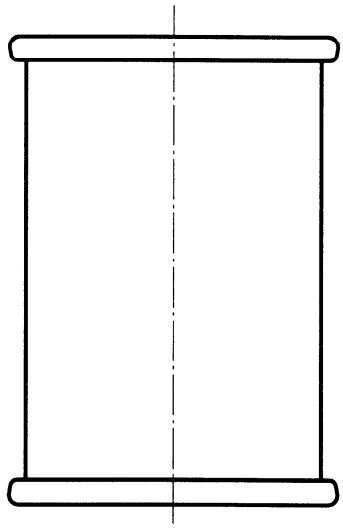


Figure 8 — Cylindrical can

2.4.2 tapered can: Can whose cross-section changes linearly from top to bottom, local variations caused by special features such as beading, necking-in, etc. being disregarded (see figure 9).

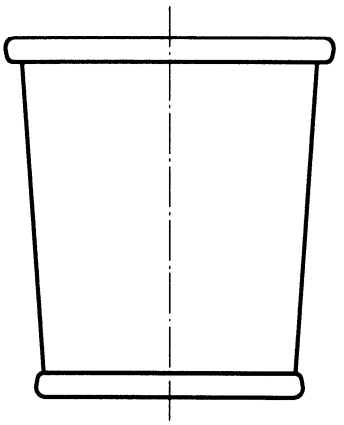


Figure 9 — Tapered can

2.5 Special features

NOTE — Figures 10 to 12 apply to both round and non-round cross-sections.

2.5.1 necked-in can: Can whose body is reduced in cross-section at one [see figure 10 b)] or both [see figure 10 a)] extremities.

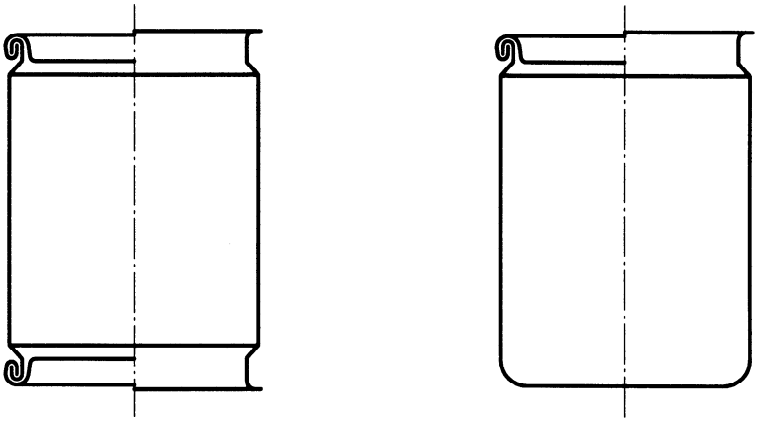


Figure 10 — Necked-in cans

2.5.2 step-sided can: Can whose body is increased in cross-section at one extremity (see figure 11).

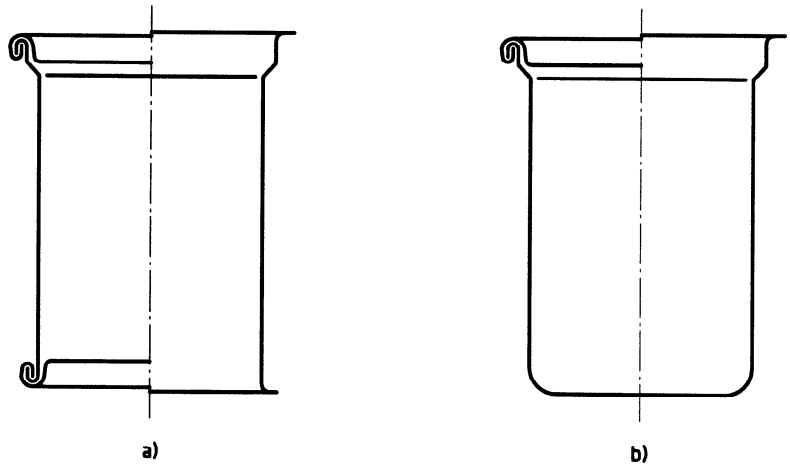


Figure 11 — Step-sided cans

2.5.3 beaded can: Can whose body has small internal and/or external peripheral changes in cross-section (see figure 12).

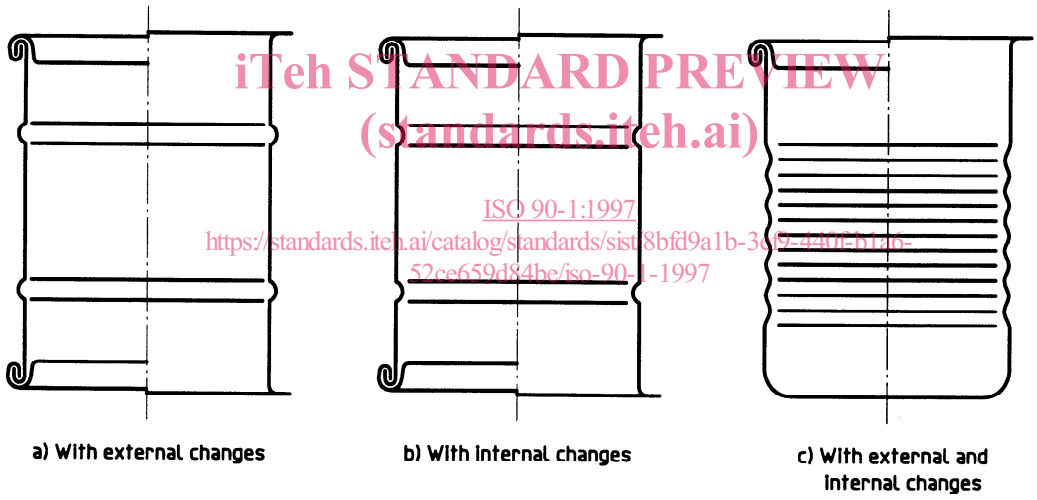


Figure 12 — Beaded cans

2.5.4 special-profile can: Can whose body varies in cross-section to give a particular profile.

2.6 Capacities

2.6.1 nominal filling volume, V: Volume, in millilitres, of product that the can is required to hold.

2.6.2 gross lidded capacity, C: Total capacity, in millilitres, of a closed can, determined in accordance with 4.2 (empty can) or annex B (full can).

2.6.3 head space for beverage cans, K: Difference between the gross lidded capacity and the nominal filling volume, expressed in millilitres or as a percentage of the gross lidded capacity.

2.6.4 freeboard for beverage cans: Height, in millimetres, from the flange of an open-top can to the surface level of a liquid product when filled to the nominal volume.

2.6.5 body height, H_1: Height, in millimetres, of the factory-finished empty can (see annex A).

3 Determination of dimensions

3.1 Measurement of cross-sections

3.1.1 Measure the internal body cross-section using a plug gauge, or derive it from the external cross-section measured with a vernier caliper.

3.1.2 Measure the necked-in or step-sided opening cross-sections using a plug gauge applied to the internal cross-section of the extremity to which the end is to be fixed.

3.1.3 Measure the opening cross-section of a cylindrical or tapered can using a plug gauge applied to the internal cross-section of the extremity to which the end is to be fixed.

3.2 Nominal cross-sections

The nominal cross-section is determined by rounding the internal body cross-section (see 3.1.1) or necked-in or step-sided cross-section (see 3.1.2) to the nearest whole millimetre (if the first decimal is 5 or above, round up; in all other cases, round down).

3.3 Measurement of height

See annex A.

3.4 Characteristic dimensions

Nominal cross-sections are characterized by the dimensions specified in 3.4.1 to 3.4.4.

3.4.1 Cylindrical round can

Dimension D (see figure 1).

3.4.2 Cylindrical non-round can

Dimensions A and B (see figures 2 to 5).

3.4.3 Tapered round can

Dimensions D_1 and D_2, of which D_1 is the larger and D_2 the smaller (see figure 13).

3.4.4 Tapered non-round can

Dimensions A_1, B_1, A_2 and B_2, of which A_1 and B_1 are the larger and A_2 and B_2 the smaller dimensions (see figure 13).

3.5 Special features

3.5.1 Necked-in cans

The cross-sections in the necked-in area shall be indicated as follows (see clause 6 and figure 13):

— for round cans:

D_{N1} - top end;

D_{N2} - bottom end;

— for non-round cans:

$A_{N1} \times B_{N1}$ - top end;

$A_{N2} \times B_{N2}$ - bottom end.