Doc. No.: PGD 32(27406)WC
March 2025

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

भारतीय मानक मसौदा

खाद्य और पेय पदार्थों के लिए गोल आसानी से खुलने वाले सिरे — विशिष्टि

Draft Indian Standard

Round Easy Open Ends for Foods and Beverages — Specification

ICS 55.120

Metal Containers Sectional Committee, PGD 38 Last Date for Comments: 01 May 2025

FOREWORD

(*Formal clauses will be added later.*)

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values' (*second revision*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

ROUND EASY OPEN ENDS FOR FOODS AND BEVERAGES — SPECIFICATION

1 SCOPE

This standard specifies the requirements of round easy open ends.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

IS No.	*Title*
IS 737 : 2024	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes — Specification (*fifth revision*)
IS 1993 : 2018 ISO 11949 : 2016	Cold-reduced tinmill products — Electrolytic tinplate (*fifth revision*)
IS 12591 : 2018 ISO 11950 : 2016	Cold-reduced tinmill products — Electrolytic chromium/chromium oxide-coated steel (*second revision*)
IS 14246 : 2024	Continuously pre-painted galvanized steel sheets and strips — Specification (*second revision*)

3 TERMINOLOGY

3.1 Easy Open End (EOE) — End comprised of a sheet metal made of aluminium alloy, electrolytic tinplate or electrolytic chromium/chromium oxide coated steel, with a score line, and a tab attached by rivet for easy opening.

4 CLASSIFICATION

Round easy open ends can be of following types based its application (see Fig. 1 for a top view):

a) round easy open ends for food cans
b) round easy open ends for beverage cans
c) round easy open ends for solid food cans

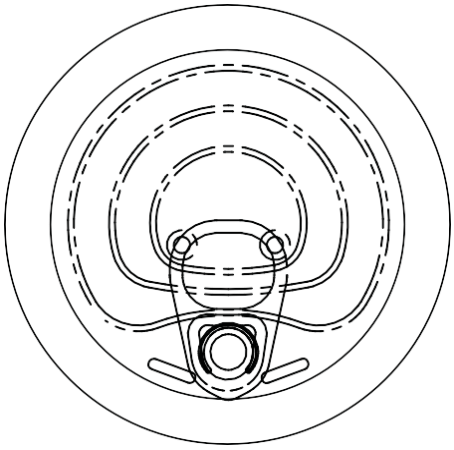

Fig. 1 Round Easy Open End

5 MATERIAL

5.1 Steel Easy Open Ends

The EOE shell shall be made from electrolytic tinplate conforming to IS 1993 or electrolytic chromium/chromium oxide coated steel conforming to IS 12591.

The EOE tab shall be made from galvanized steel conforming to IS 14246. In case aluminium tab is used, it shall conform to **5.2**.

5.2 Aluminium Easy Open Ends

The EOE shell and EOE tab shall be made from aluminium alloy conforming to IS 737 of grade and temper as given in Table 1.

Table 1 Aluminium Grade Designation for Easy Open Ends
(*Clause* 5.2)

Component	Temper	Aluminium Grade Designation	
		For Beverage Applications	For Food Applications
(1)	(2)	(3)	(4)
Shell	H48 or H49	5182 (54300B)	8018 (81400C)
Tab	H18, H19, H38, H39, H48 or H49	5182 (54300B)	5182 (54300B)

6 DIMENSIONS

6.1 Round Easy Open Ends for Food Cans

The recommended dimensions and tolerance of round easy open ends for food cans are given in Table 2.

Table 2 Recommended Dimensions and Tolerance of Round Easy Open Ends for Food Cans

(*Clause* 6.1)

End size	Can diameter (d)/mm	Curl diameter (D)/mm	Curl height (h)/mm	Countersink depth (c)/mm	Curl opening (b)/mm
R200	49.50 ± 0.10	±0.10	±0.13	±0.13	≥ 3.10
R202	52.30 ± 0.10	±0.10	±0.13	±0.13	≥ 3.10
R209	62.50 ± 0.10	±0.15	±0.13	±0.13	≥ 3.10
R211	65.30 ± 0.10	±0.15	±0.13	±0.13	≥ 3.10
R214	69.90 ± 0.10	±0.15	±0.13	±0.13	≥ 3.10
R300	72.90 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R303	77.60 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R305	80.30 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R307	83.30 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R309	86.70 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R315	95.50 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R401	98.90 ± 0.20	±0.20	±0.13	±0.13	≥ 3.30
R403	102.40 ± 0.20	±0.20	±0.13	±0.13	≥ 3.30
R404	105.10 ± 0.20	±0.20	±0.13	±0.13	≥ 3.30
R603	153.40 ± 0.20	±0.20	±0.13	±0.13	≥ 3.50

6.2 Round Easy Open Ends for Beverage Cans

6.2.1 *Round Easy Open Ends for Two-Piece Beverage Cans*

The recommended dimensions and tolerance of round easy open ends for two-piece beverage cans are given in Table 3.

Table 3 Recommended Dimensions and Tolerance of Round Easy Open Ends for Two-Piece Beverage Cans

(*Clause* 6.2.1)

End Size	Can Diameter (d)/mm	Curl Diameter (D)/mm	Curl Height (h)/mm	Countersink Depth (c)/mm	Curl Opening (b)/mm
R200	49.50 ± 0.10	±0.25	±0.25	±0.25	≥ 2.62
R202	52.30 ± 0.10	±0.25	±0.25	±0.25	≥ 2.62
R206	57.00 ± 0.10	±0.25	±0.25	±0.25	≥ 2.62

6.2.2 *Round Easy Open Ends for Three-Piece Beverage Cans*

The recommended dimensions and tolerance of round easy open ends for three-piece beverage cans are given in Table 4.

Table 4 Recommended Dimensions and Tolerance of Round Easy Open Ends for Three-Piece Beverage Cans
(*Clause* 6.2.2)

End size	Can Diameter (*d*)/mm	Curl Diameter (*D*)/mm	Curl Height (*h*)/mm	Countersink Depth (*c*)/mm	Curl Opening (*b*)/mm
R113	46.30 ± 0.10	±0.10	±0.13	±0.13	≥ 2.50
R200	49.50 ± 0.10	±0.10	±0.13	±0.13	≥ 3.07
R202	52.30 ± 0.10	±0.10	±0.13	±0.13	≥ 3.07
R206	57.00 ± 0.10	±0.10	±0.13	±0.13	≥ 2.72
R209	62.50 ± 0.10	±0.10	±0.13	±0.13	≥ 3.07

6.3 Round Easy Open Ends for Solid Food Cans

The recommended dimensions and tolerance of round easy open ends for solid food cans are given in Table 5.

Table 5 Recommended Dimensions and Tolerance of Round Easy Open Ends for Solid Food Cans
(*Clause* 6.3)

End Size	Can Diameter (*d*)/mm	Curl Diameter (*D*)/mm	Curl Height (*h*)/mm	Countersink Depth (*c*)/mm	Curl Opening (*b*)/mm
R211	65.30 ± 0.10	±0.15	±0.13	±0.13	≥ 3.10
R300	72.90 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R307	83.30 ± 0.15	±0.15	±0.13	±0.13	≥ 3.30
R401	98.90 ± 0.20	±0.20	±0.13	±0.13	≥ 3.30
R502	126.50 ± 0.20	±0.20	±0.13	±0.13	≥ 3.50
R603	153.40 ± 0.20	±0.20	±0.13	±0.13	≥ 3.50

7 REQUIREMENTS

7.1 Lacquer Porosity

The average enamel rater reading for a sample of minimum 10 ends shall not exceed 10 mA and no individual reading shall exceed 15 mA.

7.2 Compound Weight

Compound weight refers to the amount of sealing compound (usually a liquid gasket material) applied to the end during manufacturing. This compound ensures hermetic seal when the lid is seamed onto a can. The amount applied depends on the end size, end type (that is, whether it is an end for food cans, or it is an end for beverage cans), and type of compound used.

The compound weight shall be as agreed between the manufacturer and the purchaser. The dry weight of the residual compound shall be used in the measurement.

7.3 Pop and Tear Test

The representative sample ends shall conform to the requirements when tested in accordance with Annex A.

8 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed there under, and the product(s) may be marked with the Standard Mark.

ANNEX A

(*Clause* 7.3)

POP AND TEAR TEST

A-1 The pop and tear test evaluate the opening performance of easy open ends by measuring the force required to lift the tab (pop) and fully remove the scored panel (tear).

A-2 POP TEST (TAB OPENING FORCE)

A-2.1 Purpose

To measure the force required to lift the tab and initiate the opening process.

A-2.2 Equipment

a) Force gauge (digital or mechanical) with a hook attachment, and
b) Customized fixture to hold the end securely.

A-2.3 Procedure

A-2.3.1 Secure the easy open end on a stable platform to prevent movement.

A-2.3.2 Position the force gauge hook under the tab's free end.

A-2.3.3 Apply an upward force at a constant speed until the tab pops and lifts the panel slightly.

A-2.3.4 Record the peak force required to initiate the pop.

A-2.4 Acceptance Criteria

The force shall be maximum 25 N.

A-3 TEAR TEST (PANEL REMOVAL FORCE)

A-3.1 Purpose

To measure the force required to fully remove the scored panel after popping the tab.

A-3.2 Procedure

A-3.2.1 After the pop test (**A-2.3**), continue pulling the tab to begin tearing the scored panel.

A-3.2.2 The end shall remain fixed in the holder.

A-3.2.3 Pull the tab at a constant speed along the tear direction.

A-3.2.4 Record the peak force required for continuous tearing.

A-3.3 Acceptance Criteria

The force shall be maximum 80 N.