भारतीय मानक

Indian Standard

IS 14407 : 2023

पेय पदार्थों के लिए एल्युमिनियम के डिब्बे — विशिष्टि

(पहला पुनरीक्षण)

Aluminium Cans for Beverages — Specification

(First Revision)

ICS 55.120

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
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August 2023 **Price Group 8**

Metal Containers Sectional Committee, PGD 38

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal Containers Sectional Committee had been approved by the Production and General Engineering Division Council.

This standard was first published in 1996. The first revision has been taken up to keep pace with the latest technological developments and international practices. In this revision following major changes have been made:

a) Scope has been broadened to allow for the packaging of different kinds of beverages;
b) Material requirement has been modified;
c) Dimensional requirements have been modified along with the addition of dimensions for cans of capacity 150 ml, 185 ml, 200 ml, 300 ml, 355 ml, 450 ml, 550 ml, 750 ml, and 1000 ml;
d) Slip angle test has been added;
e) Enamel rater criteria has been specified on the basis of beverage type; and
f) Requirement for overall and specific migration limit has been added.

The composition of the Committee responsible for formulation of this standard is given in Annex D.

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.

Indian Standard

ALUMINIUM CANS FOR BEVERAGES — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the specification for two-piece aluminium cans for the packaging of alcoholic, non-alcoholic and dairy based beverages.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions 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 editions of these standards.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1394, IS 11104, and the following shall apply:

3.1 Alcoholic Beverage — A beverage or a liquor or a brew containing more than 0.5 percent alcohol by volume (ABV). The ABV limit shall be zero in case of alcohol free beer.

3.2 Dairy Based Beverage — The beverage obtained by processing of milk or containing dairy ingredient.

3.3 Non-Alcoholic Beverages — Beverages which includes fruit and vegetable juices, fruit and vegetable nectars, soya based beverages, cocoa based beverages, water-based flavoured carbonated and non-carbonated beverages, and water based brewed or steeped beverages such as coffee and tea.

3.4 Brimful Capacity — The volume of fluid required to fill the bottle completely to brim level at (27 ± 2) ºC.

3.5 Nominal Capacity — The volume of fluid normally expected to be filled in the bottles at (27 ± 2) ºC.

3.6 Traceability — The ability to follow the movement of a food article through specified stage(s) of its production, processing and distribution.

4 CAPACITY

Cans shall be of 150 ml, 185 ml, 200 ml, 250 ml, 300 ml, 330 ml, 355 ml, 450 ml, 500 ml, 550 ml, 750 ml and 1 000 ml capacity. In addition, cans may be of any capacity as agreed between the manufacturer and the purchaser.

5 MATERIAL

5.1 The can body stock shall be made from aluminium alloy of composition as given in Table 1A. The can end stock and can tab stock shall be made from aluminium alloy of composition as given in Table 1B. The test method for analysing the composition should be as per IS 504 (Part 1 to 12) and IS 504 (Part 13 to 16). Any other suitable instrumental/chemical method may also be used.

5.2 The temper of the aluminium alloy shall be as given in the table below (*see* Annex B for the temper designations).

Component	*Temper*
Body	H18 or H19
End	H48 or H49
Tab	H38, H39, H48 or H49

5.3 The mechanical properties of the alloys for the body and closure shall be as given in Table 2A and Table 2B, respectively.

5.4 For the can body stock, there shall be lubrication applied to protect from post coil production oxidation.

6 REQUIREMENTS

6.1 Manufacture

6.1.1 *Can Body*

The can body shall be of seamless construction, that is manufactured using draw and ironing process.

6.1.2 *Can Ends*

6.1.2.1 The cans shall have leakproof and pilfer-proof closure system. The closure component

'Easy Open End (EOE)' may be used as the can end. Each EOE shall be made from two different pieces, shell and the tab. Can ends diameter shall be in sizes of 200, 202, 206 and 209.

NOTE — 202 stands for 2 inches + 02/16 of an inch. Other sizes shall be read accordingly.

6.1.2.2 The resealable can ends may be used as per agreed specifications between manufacturer and purchaser.

6.1.2.3 The closure components shall be lined with a suitable liner compound. The liner compound shall be non-toxic, compatible with the product packed and shall not impart off-flavour, off-odour, off-taste or loss of flavour. The position of the liner compound shall be in such a way that it does not get in contact with product filled inside.

6.2 Internal Finish

The internal surface of the can and the can end shall be suitably lacquered. Epoxy, polyester or acrylic water based lacquers can be used for the coating. The coating shall not allow the beverage to come in contact with the metal surface. This can be achieved through applying sufficient amount of coating with respect to the type of aggressiveness of the product filled in.

6.3 External Coating

Each can body shall be applied with an external coating material. Polyester or acrylic water-based lacquer can be used for the coating. This shall be compatible with the suitable heat treatment meeting maximum time and temperature requirement of beverage filling process. Cans should be cured properly to avoid any mobility and scuffing issues. There are varieties of external finishes such as gloss, matt, tactile, etc, which may be used based on the agreement between the supplier and the customer.

6.3.1 *Bottom Rim Coating*

Cans shall have a bottom coating at its rim, to facilitate easy movement of empty can on conveyers.

6.3.2 *Pasteurisation and Retort Coating*

The can ends shall have coated tab to protect from discolouration during pasteurisation or retort process.

6.4 Shape and Dimensions

6.4.1 The shape and nominal dimensions of the cans shall be as given in Table 3. Cans of capacity other than those mentioned in Table 3 may be of shape and dimensions as agreed between the manufacturer and the purchaser. For cans of any capacity, the minimum wall thickness should be 50 μm.

6.4.2 The shape and nominal dimensions of the closure components for cans shall be as given in Table 4.

Table 1A Composition of Aluminium Alloy for Can Body Stock

(*Clause* 5.1)

Sl No.	Cu	Mg	Si	Fe	Mn	Zn	Ti	Cr	Ga	V	Others Total	Al
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	0.05 - 0.25	0.8 -1.3	0.6	0.8	0.8 - 1.4	0.25	0.1	—	0.05	0.05	0.15	Remainder

NOTE — Composition limits are in weight percent maximum, unless shown as a range or a minimum.

Table 1B Composition of Aluminium Alloy for Can End Stock (Shell) and Can Tab Stock

(*Clause* 5.1)

Sl No.	Cu	Mg	Si	Fe	Mn	Zn	Ti	Cr	Ga	V	Others Total	Al
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	0.15	4.0 - 5.0	0.2	0.35	0.2 - 0.5	0.25	0.1	0.1	—	—	0.15	Remainder

NOTE — Composition limits are in weight percent maximum, unless shown as a range or a minimum.

Table 2A Mechanical Properties of Aluminium Alloy for Can Body

(*Clause* 5.3)

Sl No.	Temper	Tensile Test						Bend Test	
		Specified Thickness mm		Tensile Strength MPa		0.2 % Proof Stress MPa		Elongation *Min* %	
		over	up to	*Min*	*Max*	*Min*	*Max*	A_{50mm}	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	H18	≥ 0.2	0.5	265	—	215	—	1	—
ii)	H19	≥ 0.2	0.5	275	—	—	—	1	—

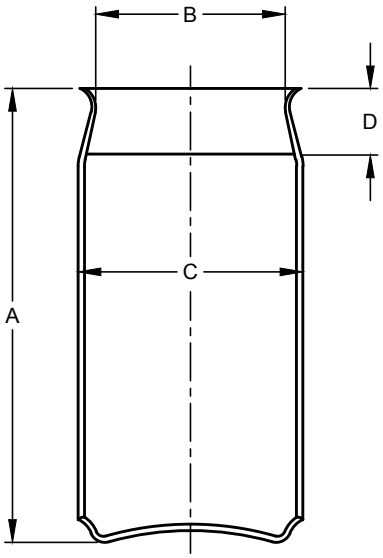
Table 2B Mechanical Properties of Aluminium Alloy for Can Closure

(*Clause* 5.3)

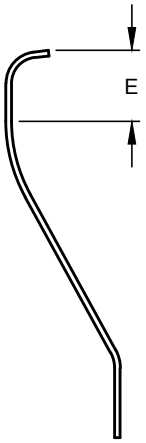
Sl No.	Temper	Tensile Test							
		Specified Thickness mm		Tensile Strength MPa		0.2 % Proof Stress MPa		Elongation *Min* %	
		over	up to	*Min*	*Max*	*Min*	*Max*	A_{50mm}	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	H18 or H38	≥ 0.2	0.5	345	—	—	—	1	—
ii)	H19 or H38	≥ 0.2	0.5	365	—	—	—	1	—

Table 3 Dimensions of Aluminium Beverage Cans

(*Clause* 6.4.1)



CROSS SECTIONAL VIEW OF CAN BODY



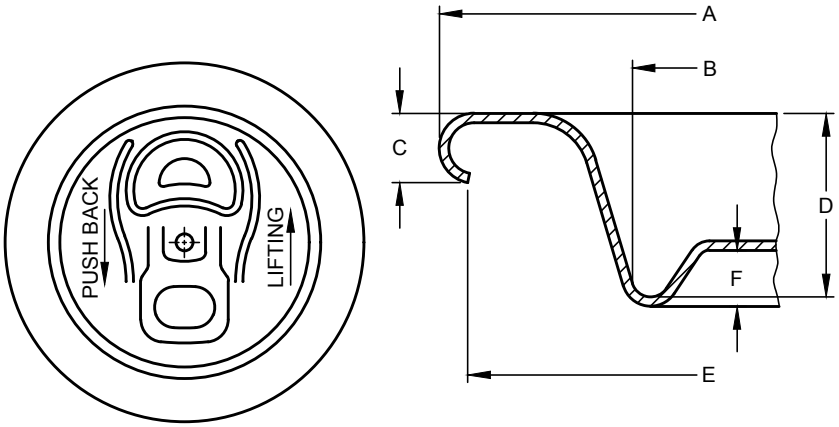
CROSS SECTIONAL VIEW OF NECK

Sl No.	Nominal Capacity	Can Type [1)]	Dimensions					Brimful Capacity
			Finished Can Height, *A*	Inside Neck/Plug Diameter, *B*	Outside Can Diameter, *C*	Free Board, *D*	Neck Seaming Clearance, *E*	
	ml		mm	mm	mm	mm	mm	ml
			± 0.30	± 0.30	*Max*	Nominal	*Min*	Nominal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	150	Slim	88.50	50.00	53.6	14.10	3.05	180.00
ii)	185	Slim	103.38	50.00	53.6	14.10	3.05	211.00
iii)	250	Slim	134.00	50.00	53.4	14.10	3.05	278.00
iv)	250	Stubby	91.49	52.40	66.6	11.90	3.05	276.00
v)	200	Fit	95.20	50.0 or 52.4	58.1	13.50	3.05	228.50
vi)	300	Fit	133.89	50.0 or 52.4	58.1	13.50	3.05	328.50
vii)	330	Fit	145.40	50.0 or 52.4	58.1	13.50	3.05	358.00
viii)	355	Fit	156.60	50.0 or 52.4	58.1	15.00	3.05	388.00
ix)	330	Standard	115.20	52.40	66.6	12.00	3.05	358.00
x)	355	Standard	122.20	52.40	66.6	11.90	3.05	382.00
xi)	500	Standard	168.00	52.40	66.6	14.50	3.05	533.50
xii)	450	Standard	168.00	52.40	63.8	16.50	3.05	493.00
xiii)	750	Jumbo	160.00	62.56	84.7	14.00	3.05	798.00
xiv)	1 000	Jumbo	204.80	62.56	84.7	13.00	3.05	1046.00

1) Jumbo, standard, stubby, sleek, fit and slim are the can size names based on 3 variables, that is, finished can height, outer can diameter and the neck diameter to differentiate from each other.

Table 4 Dimensions for Can Ends

(*Clause* 6.4.2)



TOP VIEW SECTIONAL VIEW

Sl No.	Can End Size	Can End Type [2]	Dimensions					
			Outside Curl Diameter, A	Punch Plug Diameter, B [1]	Curl Height, C	Inside Curl Diameter, E	Countersink Depth, D	Panel Height, F [1]
			mm	mm	mm	mm	mm	mm
			± 0.25	—	± 0.15	*Min*	± 0.15	—
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	200	B64	57.15	46.46	2.08	55.45	6.73	2.24
ii)	202	B64	59.41	48.59	2.08	57.66	6.86	2.44
iii)	206	B64	64.82	54.62	2.11	62.71	6.5	2.21
iv)	209	B64	69.6	62.56	2.21	67.92	6.86	1.91
v)	200	CDL	56.9	45.03	2.07	55.25	6.35	2.04
vi)	202	CDL	59.3	47.42	2.07	57.66	6.35	2.04
vii)	202	ISE	59.29	47.12	2.03	57.66	6.17	2.13

1) This dimension is given for reference only.
2) B64, CDL and ISE are the reference names for specific design type for the can ends.

7 TESTS

7.1 Testing of Cans

7.1.1 *Top Load /Axial Load /Column Strength*

Empty can shall withstand a minimum axial load of 675 N.

Top load shall be applied uniformly on the top of the can at a constant rate of 13 mm per minute.

7.1.2 *Enamel Rater Criteria*

The enamel rater criteria depends on type of filled product. The enamel rater reading for an individual can and an average of minimum 24 cans shall conform to the table given below:

Sl No.	*Beverage Type*	*Individual (Max), mA*	*Average of Min* 24 *Cans (Max), mA*
(1)	(2)	(3)	(4)
i)	Carbonated soft drinks without fruit juice	25	5
ii)	Carbonated soft drinks with less than 10 percent fruit juice		
iii)	Non-carbonated soft drinks with less than 25 percent fruit juice		
iv)	Non-carbonated soft drinks with 25 percent or more fruit juice	15	5
v)	Carbonated soft drinks with between 10 percent and 25 percent fruit juice		
vi)	Hot Filled Beverages		
vii)	Wine Coolers	10	2
viii)	Lactic acid drink		
ix)	Vegetable juices		
x)	Carbonated soft drinks with more than 25 percent fruit juice		
xi)	Isotonic drinks		
xii)	Beverages containing greater than 100 ppm chlorides		
xiii)	Retort products		
xiv)	Alcoholic beverages other than wine & beer		
xv)	Beer	100	75
NOTE — If the formulation is aggressive and requires stringent metal exposure than the figures given in the table then the same is applicable as minimum standard for the specific product.			

7.1.3 *Buckle Strength/Dome Reversal*

The minimum bottom buckle and end peaking pressure shall be 620 kPa. While testing, pressurize the cans gradually using compressed air or CO_2 simulating pasteurizer or warmer conditions. Regulate the compressed air flow using controllers (65 ± 50 kPa/s) till internal pressure reaches to 450 kPa. Once the internal can pressure reaches 450 kPa, increase the flow (170 ± 50 kPa/s) till the can dome is buckled. Record the maximum pressure at which the can reverse (buckle). This test is applicable for cans used for carbonated beverages.

7.1.4 *Air Pressure Test*

The cans shall be subjected to air pressure of 620 kPa for a period of 15 s as per the test method described in IS 2471. The cans shall show no leakage when immersed in water. This test is applicable for cans used for non-carbonated beverages.

7.1.5 *Slip Angle Test/Wall Mobility Test*

The slip angle should be not more than 20º (0.1 µ coefficient of friction) for gloss over varnish when tested as per methods described in Annex C. For another speciality over varnish, slip angle should be as agreed between the customer and the supplier.

7.2 Testing of Ends

The force required to achieve venting shall not exceed 35.6 N force for a can end, and the average of a lot shall be less than 28.9 N force, when measured using a can end opening performance testing gauge.

7.3 Migration Tests

7.3.1 *Overall Migration Limit*

All cans shall have overall migration limit of 60 mg/kg or 10 mg/dm^2 when tested as per IS 9845 with no visible colour migration.

7.3.2 *Specific Migration Limit*

The specific migration shall not exceed the maximum limit given in Table 5. The sample for the specific migration test shall be prepared as per IS 9845 wherein the lacquer would be exposed to the simulants. The extracted simulants shall be then detected for elements given in Sl No. 1 to 8 of Table 5 in accordance with the test method specified in IS 3025 (Part 2) or IS 3025 (Part 65). DEHP shall be measured as per the method specified in ISO 18856.

8 SAMPLING

The representative samples of cans for attributed defects and tests shall be drawn as prescribed in IS 2500 (Part 1).

9 MARKING

9.1 Each can body and can end shall be marked with the following particulars:

a) Indication of the source of manufacture;
b) Date of manufacture and lot number so as to facilitate complete traceability; and
c) Any other information as required by the purchaser.

9.2 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.

Table 5 Specific Migration Limits

(*Clause* 7.3.2)

Sl No.	**Substances**	**Maximum Migration Limit** mg/kg
(1)	(2)	(3)
i)	Barium	1
ii)	Cobalt	0.05
iii)	Copper	5.0
iv)	Iron	48.0
v)	Lithium	0.6
vi)	Manganese	0.6
vii)	Zinc	25
viii)	Antimony	0.04
ix)	Phthalic acid, bis (2-ethylhexyl)ester (DEHP)	1.5

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No./Other Publications	*Title*
IS 504 (Part 1 to 12)	Chemical analysis of aluminium and its alloys (Parts 1 to 12) (*second revision*)
IS 504 (Part 13 to 16)	Chemical analysis of aluminium and its alloys (Parts 13 to 16) (*second revision*)
IS 1394 : 1984	Glossary of terms relating to metal containers (*third revision*)
IS 2471 : 1963	Methods of tests for metal containers
IS 2500 (Part 1) : 2000/ISO 2859-1 : 1999	Sampling procedures for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (*third revision*)
IS 3025 (Part 2) : 2019/ISO 11885 : 2007	Methods of sampling and test (physical and chemical) for water and wastewater: Part 2 Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (*first revision*)
IS 3025 (Part 65) : 2022/ISO 17294-2 : 2016	Methods of sampling and test (physical and chemical) for water and wastewater: Part 65 Application of inductively coupled plasma mass spectrometry (ICP-MS) — Determination of selected elements including uranium isotopes (*first revision*)
IS 9845 : 1998	Determination of overall migration of constituents of plastics materials and articles intended to come in contact with foodstuffs — Method of analysis (*second revision*)
IS 11104 : 2012	Glossary of terms relating to open top sanitary cans
ISO 18856 : 2004	Water quality — Determination of selected phthalates using gas chromatography/mass spectrometry

ANNEX B

(*Clause* 5.2)

TEMPER DESIGNATIONS

B-1 H TEMPER DESIGNATION

H temper designation (strain-hardened) applies to products subjected to the application of cold work after annealing (or after hot forming), or to a combination of cold work and partial annealing or stabilizing, in order to achieve the specified mechanical properties. The letter H is always followed by two digits, the first indicating the specific combination of basic operations and the second indicating the degree of strain hardening.

B-2 SUBDIVISIONS OF H TEMPER DESIGNATION

B-2.1 First Digit After H

The first digit following the letter H indicates the specific combination of basic operations as follows:

a) *H1X Strain-hardened only* — These designations apply to products that are strain-hardened to obtain the desired strength without supplementary thermal treatment.

b) *H2X Strain-hardened and partially annealed* — These designations apply to products that are strain-hardened more than the desired final amount and then reduced in strength to the desired level by partial annealing. For alloys that age-soften at room temperature, the H2X tempers have the same minimum ultimate tensile strength as the corresponding H3X tempers. For other alloys, the H2X tempers have the same minimum ultimate tensile strength as the corresponding H1X tempers and slightly higher elongation.

c) *H3X Strain-hardened and stabilized* — These designations apply to products that are strain-hardened and whose mechanical properties are stabilized either by a low temperature thermal treatment or as a result of heat introduced during fabrication. Stabilization usually improves ductility. This designation is applicable only to those alloys which, unless stabilized, gradually age-soften at room temperature.

d) *H4X Strain-hardened and lacquered or painted* — These designations apply to products that are strain-hardened and which are subjected to some thermal operation during the subsequent painting or lacquering operation.

B-2.2 Second Digit After H

The second digit following the letter H indicates the final degree of strain hardening, as identified by the minimum value of the ultimate tensile strength.

a) 8 has been assigned to the hardest tempers normally produced. The minimum tensile strength of tempers HX8 may be determined from Table 6 and is based on the minimum tensile strength of the alloy in the annealed temper.

Table 6 Determination of HX8 Minimum Tensile Strength

(*Clause* B-2.2)

Sl No.	Minimum Tensile Strength in Annealed Temper	Increase in Tensile Strength to HX8 Temper
	MPa	MPa
(1)	(2)	(3)
i)	up to 40	55
ii)	45 to 60	65
iii)	65 to 80	75
iv)	85 to 100	85
v)	105 to 120	90
vi)	125 to 160	95

Table 6 (*Concluded*)

Sl No.	Minimum Tensile Strength in Annealed Temper	Increase in Tensile Strength to HX8 Temper
	MPa	MPa
(1)	(2)	(3)
vii)	165 to 200	100
viii)	205 to 240	105
ix)	245 to 280	110
x)	285 to 320	115
xi)	325 and over	120

b) Tempers between O (annealed) and HX8 are designated by numerals 1 to 7:

1) HX4 designates tempers whose ultimate tensile strength is approximately midway between that of the O temper and that of the HX8 tempers;

2) HX2 designates tempers whose ultimate tensile strength is approximately midway between that of the O temper and that of the HX4 tempers;

3) HX6 designates tempers whose ultimate tensile strength is approximately midway between that of the HX4 tempers and that of the HX8 tempers; and

4) HX1, HX3, HX5 and HX7 designate tempers intermediate between those defined above.

The ultimate tensile strength of the odd numbered intermediate (-HX1, -HX3, -HX5 and -HX7) tempers, determined as described above, shall be rounded to the nearest multiple of 5 MPa.

c) HX9 designates tempers whose minimum ultimate tensile strength exceeds that of the HX8 tempers by 10 MPa or more.

ANNEX C

(*Clause* 7.1.5)

METHOD OF TEST FOR SIDE WALL MOBILITY

C-1 Side wall mobility of the beverage aluminium can is important to ensure that the cans move smoothly at the customer filling line, track works etc. This can be measured by using either tilt table or through mobility testing unit.

C-2 USING TILT TABLE

C-2.1 Procedure

Place the can to be tested on top of two other cans placed on a tilt table and allow the equipment to start. The angle at which the test can slides, stop the equipment and take the reading to measure the surface smoothness for the mobility.

C-2.2 Observation

At the end of the test record the reading in the dial gauge marked in degrees. It should be less than 20º to say that the cans will run smoothly.

C-3 USING MOBILITY TESTER

C-3.1 Procedure

Place the test sled on the can sample and connect the sled hook to the eye on the force gauge. Place the fixture mounted ‘speed control’ to the ‘5’ position. Move the test switch to the ‘Test’ position. The gauge will drag the testing sled across the sample and the coefficient of friction can be read directly from the force gauge dial indicator. At the end of the test carriage remove the test sled.

C-3.2 Observation

At the end of the test, record the reading in the dial gauge marked in coefficient of friction. It should be less than 0.1 μ to say that the cans will run smoothly.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Metal Containers Sectional Committee, PGD 38

Organization	*Representative(s)*
In Personal Capacity (*Flat No. P04, IVY Tower, Nahar Amrit Shakti, Chandivali, Powai, Mumbai - 400072*)	DR N. C. SAHA **(*Chairperson*)**
Ace Cans Manufacturing Company, Mumbai	SHRI KANAK RAJ PARMAR SHRI DINESH PARMAR (*Alternate*)
Akzo Nobel India Limited, Gurugram	SHRI MANOJ KUMAR SHARMA SHRI SWAPAN KUMAR BHANDARI (*Alternate*)
Asian Paints Limited, Mumbai	SHRI NAVNINDER SINGH MS SHWETA TIWARI (*Alternate*)
Ball Beverage Packaging (India) Private Limited, Bengaluru	SHRI GANESH NETHA
Balmer Lawrie and Company Limited, Mumbai	SHRI R. S. PATEL SHRI AMIT MITRA (*Alternate*)
Balmer Lawrie-Van Leer Limited, Mumbai	SHRI TUSHAR SHIRWALKAR
Blossom Industries Limited, Daman	SHRI RAJ KUMAR SHARMA
Canpack India Private Limited, Aurangabad	SHRI SWAPNIL KHESE SHRI AKSHAY SUDAME (*Alternate*)
Caps and Containers, Mumbai	SHRI O. P. AGARWAL MS MANISHA AGARWAL (*Alternate*)
Cargill India Private Limited, Gurugram	SHRI SEKHAR PAL MS NEHA PARASHAR (*Alternate*)
Central Insecticide Laboratory, Faridabad	DR J. P. SINGH DR BRIJESH TRIPATHI (*Alternate*)
Chemco Plastic Industries Private Limited, Mumbai	SHRI GAURAV SARAOGI MS RUPANDE SAMPAT (*Alternate*)
Coca-Cola India Private Limited, Gurugram	SHRI VIRENDRA LANDGE MS NISHTHA CHAUHAN (*Alternate*)
Dharampal Satyapal Group, Noida	SHRI SANJAY GUPTA
Directorate General of Quality Assurance, CQA (GS), Kanpur	SHRI M. SATYANARAYANA SHRI BANMALI BEHRA (*Alternate*)

Organization	*Representative(s)*
Hindustan Petroleum Corporation Limited, Mumbai	SHRI RAVI KUMAR SHRI SUNIL SHANKAR PATIL (*Alternate*)
Hindustan Tin Works Limited, New Delhi	SHRI GAJENDRA SINGH SHRI R. K. TYAGI (*Alternate*)
Indian Institute of Packaging, Delhi	PROF TANVEER ALAM SHRI MADHAB CHAKRABORTY (*Alternate*)
Indian Oil Corporation Limited, Mumbai	SHRI S. MARIMUTHU SHRI S. SHRIDHAR (*Alternate*)
JSW Steel Coated Products Limited, Mumbai	SHRI ABHIJIT CHIVANE SHRI CHANCHAL KUMAR KARMAKAR (*Alternate*)
Kaira Can Company Limited, Mumbai	SHRI K. M. SHENOY SHRI SURESH PANCHAL (*Alternate*)
Ministry of Consumer Affairs, Food and Public Distribution, New Delhi	SHRI B. N. DIXIT
Nestle India Limited, Gurugram	SHRI BISWAJIT BASU SHRI BARUN BANERJEE (*Alternate*)
PPG Asian Paints Private Limited, Mumbai	SHRI SANJAY GHEMAD
Recon Machine Tools Private Limited, Mumbai	SHRI P. A. PAI SHRI ASHWIN PAI (*Alternate*)
Shetron Limited, Bengaluru	SHRI KARTIK NAYAK SHRI NITHIN KUMAR SHETTY (*Alternate*)
The Tinplate Company of India Limited, Jamshedpur	DR SOURAJYOTI DEY SHRI BABLU KUMAR SINGH (*Alternate*)
Valspar (India) Coatings Corporation Private Limited, Bengaluru	SHRI RAJAT BHATTACHARJEE SHRI SANJAY TYAGI (*Alternate*)
BIS Directorate General	SHRI R. R. SINGH, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (PRODUCTION AND GENERAL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

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Panel for Aluminium Container for Beverages, PGD 38/P2

Organization	*Representative(s)*
Coca-Cola India Private Limited, Gurugram	SHRI VIRENDRA LANDGE **(*Convenor*)**
Akzo Nobel India Limited, Gurugram	SHRI SWAPAN KUMAR BHANDARI
Ball Beverage Packaging (India) Private Limited, Bengaluru	SHRI GANESH NETHA
Blossom Industries Limited, Daman	SHRI RAJ KUMAR SHARMA
Canpack India Private Limited, Aurangabad	SHRI SWAPNIL KHESE
Coca-Cola India Private Limited, Gurugram	MS NISHTHA CHAUHAN
Hindalco Industries Limited, Mumbai	SHRI GAURAV MAHAJAN
Nestle India Limited, Gurugram	SHRI BISWAJIT BASU
PPG Asian Paints Private Limited, Mumbai	SHRI VISHAL GANDHI
Valspar (India) Coatings Corporation Private Limited, Bengaluru	SHRI MANISH NARAIN

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