**IS 14764 : 2024**

***भारतीय मानक***

***Indian Standard***

**वनस्पति सहित ठोस और अर्ध-ठोस**

**खाद्य पदार्थों की पैकेजिंग के लिए** पोलीइथाइलीन **टेरेफ्थेलेट (पीईटी)**

**कंटेनर — विशिष्टि**

(*पहला पुनरीक्षण*)

**POLY (ETHYLENE TEREPHTHALATE) (PET) CONTAINERS FOR THE PACKAGING OF SOLID AND**

**SEMI-SOLID FOODS INCLUDING *VANASPATI* — SPECIFICATION**

(*First Revision*)

ICS 55.120; 67.200.10

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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Plastics Packaging Sectional Committee, PCD 21

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Packaging Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Poly (ethylene terephthalate) (PET) bottles/containers are popular because of ease of handling, safety, light weight and superior barrier properties against water vapour, carbon-dioxide and oxygen, excellent retention of organoleptic properties and ease of recyclability for packaging of food items. Containers/bottles produced using virgin PET are normally made without the use of any additives or plasticizers. These features provide an additional impetus for the popularity of PET. Use of PET containers for packaging of *vanaspati* has been approved in the IS 10171 : 1999 “Guide on suitability of plastics for food packaging”.

This standard was originally published in 2000. In view of their several advantages, PET containers have been increasingly used for packaging several semi-solid fatty foods beyond *vanaspati*. Hence, in this revision, the scope of this standard has been expanded to include other edible fats and edible fat emulsions [as listed in section 2.0 of *Food Safety and Standards (Food Products Standards and Food Additives) Regulations*, 2011], and other types of semi-solid as well as solid food items. Thus, this standard aims to address blow moulded PET containers for a comprehensive cluster of food items. This standard however does not address PET containers made by other formation techniques such as thermoforming.

This (*first)* revision has been brought out to incorporate editorial alignment and compliance with various applicable regulations. The major modifications in this revision are:

* title of the standard has been modified to reflect the enhanced scope;
* recyclability and other requirements on plastics in compliance with the *Plastic Waste Management Rules*, 2016, as amended, have been included;
* the container shall be of any nominal capacity as stipulated in *Legal Metrology (Packaged Commodity) Rules*, 2011 as amended by GSR 779(E) of 2nd Nov, 2021;
* limits on specific migration as per *Food Safety and Standards (Packaging) Regulation*, 2018, as amended, have been incorporated;
* test for storage stability has been incorporated; and
* the marking/labelling clause has been overhauled into marking/packing clause wherein the labelling requirements have been placed in accordance with the *Food Safety and Standards (Labelling and Display) Regulation*, 2020 and its Amendments.

Semi-solid fatty foods are presently packed in tin containers, laminated paper boards, blow-moulded HDPE containers and flexible pouches/packs. The Indian Standards published on the subjects are given in Annex B.

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

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*

POLY (ETHYLENE TEREPHTHALATE) (PET) CONTAINERS FOR THE PACKAGING OF SOLID AND SEMI-SOLID FOODS INCLUDING *VANASPATI* — SPECIFICATION

(*First Revision*)

**1** **SCOPE**

This standard prescribes the requirements, methods of sampling and tests for suitably blow moulded poly (ethylene terephthalate) (PET) containers for the packaging of a variety of solid and semi-solid food items.

NOTE — Typical examples of the food items are: solid foods [such as bakery products, cereals, chips, confectionaries, dairy products (such as *khoya* and its products), dry chutneys, dry fruits, food grains, savouries (such as *chiwda*)] and semi-solid foods [such as *vanaspati*, fatty foods (such as butter, creams, *makkhan*, margarine, mayonnaise, peanut butter), *ghee*, gravies, honey, paste-based products, salad & sandwich spreads, sauces, syrups, traditional foods (such as batters, *chutneys*, pickles, *shrikhand*), any other non-fatty foods.]

**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 the standards listed in Annex A.

**3 TERMINOLOGY**

For the purpose of this Standard, the definitions given in IS 7019 shall apply.

**4 REQUIREMENTS**

**4.1 PET Containers**

The PET containers shall comply with IS 12252 and IS 13193.

**4.2** **Caps**

The bottles shall be provided with a roll-on pilfer-proof (ROPP) caps which shall be made either of:

**4.2.1** *Aluminium*

Aluminium caps shall be made of annealed aluminium sheets coated inside with food grade lacquering complying with IS 8970.

**4.2.2** Plastic such as:

* High-Density Polyethylene (HDPE) complying with IS 7328; and
* Polypropylene (PP) complying with IS 10951.

**4.2.3** A Combination of plastics and metal can also be used. In such cases, the materials shall comply with **4.2.1** and **4.2.2**.

**4.3 Handles, Closures and Other Components**

Components of PET containers for semi-solid fatty foods shall be of suitable design, shape, sizes, formats, etc. as agreed to between the purchaser and the supplier. Materials for these, shall fulfil following requirements:

**4.3.1** *Handles and Closures*

**4.3.1.1** The material used for handles and closures shall be food grade material of high-density polyethylene (HDPE) conforming to IS 7328, Polypropylene (PP) conforming to IS 10951 and Polyethylene Terephthalate (PET) conforming to IS 13193.

**4.3.1.2** Other suitable materials like steel, mild steel duly protected with polish or paints to avoid rust, may also be used. These materials shall not come in direct contact with the product.

**4.3.2** *Sealing Wads in the Closure*

**4.3.2.1** The wad shall be of natural cork board or pulp board complying with IS 4664 or expanded polyethylene (EPE) or any other suitable food grade material.

NOTE — The sealing wads shall be compatible with the packed contents. PVC or PVC-aided wads shall not be used.

**4.3.3** *Container Seal*

**4.3.3.1** Aluminium foils complying with IS 8970 and laminated/coated with food grade polyethylene complying with IS 7328.

**4.3.3.2** Diaphragm seals of plastics.

**4.3.4** The pigments and colourants used for plastic components coming in contact with the contents shall comply with the list and limits of the pigments and colorants prescribed in IS 9833.

**4.4** **Labelling materials**

**4.4.1** Label material may consist of one or more of the following materials:

1. Paper labels that may optionally be
* metallised;
* coated with finishing chemicals;
* coated with PE;
* laminated with PP; and
* any combination of the above.
1. Self-adhesive plastic labels may be made of transparent or coloured Polypropylene (PP) that are suitable for flexography, rotogravure or screen printing.

**4.4.2** Sleeves made of plastics other than PVC may be used as alternative to labels.

**4.4.3** Printing inks and coating chemicals shall comply with IS 15495.

**4.4.4** Glue shall be non-toxic hot-melt or other adhesives that allows the label to be glued on the PET bottle during the entire shelf life. All glues shall be free from Bisphenol-A when tested as mentioned in ISO 18857–2.

NOTE — In-situ labels, inkjet printing and other related technological innovations may be adopted subject to their compliance with **4.4**.

**4.5** Generic requirement for all materials in this standard shall comply with stipulations in Annex C.

**4.6** All plastic materials shall comply with the stipulations of *PWM Rules*, 2016, as amended, such as recyclability, incorporation of recycled content.

**5 WORKMANSHIP AND FINISH**

**5.1 Manufacture**

**5.1.1** The container shall be manufactured by appropriate blow moulding process; the handle and the closure shall be made by injection moulding.

**5.1.2** Containers of any capacity may be provided with a handle. The container, closure and the handle shall be free from any visual defects like local thinning, warping, burning and non-uniform colour dispersion.

**6 SHAPE AND DIMENSIONS**

**6.1** PET containers and components shall be of suitable design, shape, sizes, formats, etc. as agreed to between the purchaser and the supplier. The specified overall height and diameter of the container shall be measured according to the methods given in **4.1** and **4.2** of IS 2798. The tolerances on various dimensions shall be as follows:

|  |  |
| --- | --- |
| Up to and including 100 mm | ± 0.5 mm |
| Over 100 mm and up to and including 200 mm | ± 1.0 mm |
| Over 200 mm | ± 1.5 mm |

**6.2 Wall Thickness**

The wall thickness shall be measured in accordance with the method given in **4.5** of IS 2798. The minimum wall thickness at any point of the container shall be:

* 0.20 mm for containers of 1 kg and 2 kg or 1 l and 2 l capacity;
* 0.25 mm for the containers between 2 kg or 2 l and 5 kg or 5 l capacity; and
* 0.30 mm for the containers of 5 kg or 5 l and higher capacity.

NOTES

**1** The wall thickness can be different in different segments depending on the design of the container.

**2** The wall thickness can vary within each segment of the container subject to minimum thickness mentioned above.

**7 CAPACITY (PACK SIZES)**

**7.1 Nominal Capacity**

The bottles shall be of any nominal capacities as agreed to between the purchaser and the supplier.

**7.2 Brimful Capacity**

The brimful capacity of the container needs to be higher than the nominal capacity to ensure that no spillage occurs during filling, packing, transportation, storage, handling and usage. The brimful capacity of containers shall be measured by method prescribed in **5** of IS 2798. The brimful capacity of bottle shall be as agreed between the purchaser and the supplier.

NOTE –– The brimful capacity shall exceed the nominal capacity as given in Annex **C-3.1**.

**8 MASS**

**8.1** The mass of the container shall be as agreed to between the purchaser and the supplier. The mass of the lid and handle, when provided, shall not be included in the mass of the containers.

**8.2** The tolerance on the nominal mass of the container specified by the purchaser shall be as under:

|  |  |
| --- | --- |
| **Container Capacity** (kg or litre) | **Tolerance Nominal Mass** (percent) |
| Up to 2.0 | ± 7 |
| Above 2.0 | ± 4 |

**8.3** Tolerance on the nominal specified mass of the lid and the handle checked individually shall be ± 5 percent.

**9 PERFORMANCE TESTS**

**9.1 Closure Leakage Test**

The containers filled with coloured water at ambient temperature and closed tight with the closure with inner seal heat sealed to its mouth, to be kept in an upside down on a blotting paper for 30 min as per **6.1** of IS 2798. The container shall not show any leakage on the blotting paper through the closure.

**9.2 Drop Impact Test**

**9.2.1** The container filled with water at standard temperature of (27 ± 1) °C and closed tight with the closure with inner seal heat-sealed to its mouth shall not show any sign of rupture or leakage on the part of container body, closure, handles and the inner seal, when tested in accordance with the method prescribed in **8** of IS 2798.

**9.2.2** The drop height for any container size will be as follows:

|  |  |
| --- | --- |
| **Container Capacity** (kg or litre) | **Drop Test Height** (m) |
| Up to 5 | 1.20 |
| > 5 to 10 | 1.00 |
| > 10 to 12 | 0.80 |
| > 12 to 15 | 0.50 |
| > 15 | 0.50 |

**9.2.3** The containers with the caps when subjected to the drop test according to method **8** of IS 2798 shall not show any sign of cracking, nor shall it rupture, nor shall there be any leakage from the walls of the container. Slight de-shaping of the body shall not render the container unacceptable in the test.

**9.3 Stack Load Test**

The containers shall not show any deformation likely to reduce their strength, cause leakage or reduction in effectiveness of the closure or cause instability in stacks when tested in accordance with the method prescribed in **9** of IS 2798.

**9.4 Handle Pull Test**

The container provided with the handle when tested according to the method prescribed in **11** of IS 2798 shall not show any damage to the handle or the hinges.

**9.5 Ink Adhesion for Printed Containers**

The printed containers when tested in accordance with the method prescribed in **13** of IS 2798 shall not show any significant removal of the print from the container surface and the print shall be legible to the naked eye after the test.

**9.6 Product Resistance of Printed Containers**

The printed containers when tested in accordance with the method prescribed in **14** of IS 2798 shall not show any significant removal of the print from the container surface and the print shall be legible to the naked eye after the test.

**9.7 Migration Test**

**9.7.1** *Determination of Overall Migration Test*

The PET container shall be subjected to an overall migration test as per the following requirements of IS 9845:

* The choice of simulants and test conditions (time-temperature) depends on the type of food and condition of use of food products.
* The maximum extraction values for the container material shall not exceed 60 mg/kg and 10 mg/dm2.

In the case of coloured plastic materials, colour migrated into the simulant shall not be apparent to the naked eye (*see* IS 9833). If the colour migrated is clearly visible, such materials are not suitable, even though the extractive value is within the overall migration limit.

**9.7.2** *Determination of Specific Migration*

**9.7.2.1** The specific migration is tested to determine the quantity of a specific substance that can migrate from a food packaging material or food container into food. Specific migration limits are usually expressed as mg/kg food.

**9.7.2.2** The sample/simulants shall be prepared using the procedure described in IS 9845. The testing for detection of toxic substances shall be carried out as per method given in Table 1.

**9.7.2.3** The limit of specific migration of all toxic substances when tested as prescribed in col (4) of Table 1 shall not release the substances in quantities exceeding the specific migration limits listed under Table 1.

**Table 1 Specific Migration Limits**

(*Clauses* 9.7.2.2 *and* 9.7.2.3)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Toxic Substances** | **Migration Limit, *Maximum,* mg/kg** | **Test Method** |
| (1) | (2) | (3) | (4) |
| i) | Barium | 1.0 | IS 3025 (Part 2) |
| ii) | Cobalt | 0.05 | -do- |
| iii) | Copper | 5.0 | -do- |
| iv) | Iron | 48.0 | -do- |
| v) | Lithium | 0.6 | -do- |
| vi) | Manganese | 0.6 | -do- |
| vii) | Zinc | 25.0 | -do- |
| viii) | Antimony | 0.04 | -do- |
| ix) | Phthalic acid, bis(2-ethylhexyl)ester (DEHP) | 1.5 | ISO 18856 |

**9.8 STORAGE STABILITY TEST**

**9.8.1** Storage stability test is meant to verify the suitability of the PET container for providing the desired shelf life to the content.

**9.8.2** The storage stability test shall be conducted keeping in mind the following:

**9.8.2.1** The conditions for testing non-refrigerated foods shall be:

1. For standard condition at (27 ± 1) °C and (65 ± 2) percent RH at the end of 180 days; and
2. For accelerated condition at (38 ± 1) °C and (90 ± 2) percent RH at the end of 60 days.

**9.8.3** It is the responsibility of the supplier to ascertain that the PET container can maintain quality and safety of the food content as specified by the food manufacturer over its entire shelf life. Quality and safety parameters should be as per the standard designated for the food content. In the absence of such standard, organoleptic properties and safety parameters such as rancidity, coliform count, yeast and mould content, as appropriate may be decided between the purchaser and the supplier. The food safety parameters shall meet the provisions of the applicable rules and regulations of the *Food Safety and Standards Act*, 2006.

**10 MARKING/PACKING**

**10.1** Each bottle shall be marked with:

 a) an identifier of its source (producer); and

 b) name of material (PET) along with its recycling symbol (as required by IS 14534).



**10.2** Each plastic component of the closure shall be marked with:

 a) an identifier of its source (producer); and

 b) name of material (HDPE/PP) along with its recycling symbol (as required by IS 14534).



**10.3 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 thereunder, and the products may be marked with the Standard Mark.

**10.4 ECO-Mark**

If compliant with the criteria stipulated in Annex D, the product may be marked with ECO-Mark.

**10.5 Secondary packaging for bottles/caps/closures**

a) Bottles, caps/closures shall be packed in materials as agreed to between the buyer and supplier but devoid of any component having PVC.

b) If any secondary packaging is of a plastic (non-PVC) then it shall comply with *PWM Rules* and their Amendments.

c) Packing slip in each consignment shall include:

* Nominal capacity (only for bottles);
* Batch No. or Code No. (for bottles and caps/closures); and
* Quantity (for bottles and caps/closures).

**11 SAMPLING**

Sampling of container shall be drawn and the criteria for conformity determined as described in Annex E.

**ANNEX A**

(*Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS No./Other Publications* | *Title* |
| IS 2798 : 1998 | Methods of test for plastics containers (*first 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 4664 : 2024 | Pulp board — Specification (*second revision*) |
| IS 4905 : 2015/ISO 24153 : 2009 | Random sampling and randomization procedures (*first revision*) |
| IS 7019 : 1998 | Glossary of terms in plastics and flexible packaging, excluding paper (*second* *revision*) |
| IS 7328 : 2020 | Specification for polyethylene material for moulding and extrusion (*third* *revision*) |
| IS 8970 : 1991 | Aluminium foil laminate for packaging — Specification (*first revision*) |
| IS 9833 : 2018 | List of colourants for use in plastics in contact with foodstuffs and pharmaceuticals (*second* *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 10142 : 1999 | Polystyrene (crystal and high impact) for its safe use in contact with foodstuffs, pharmaceuticals and drinking water — Specification (*first revision*)  |
| IS 10151 : 2019 | Polyvinyl chloride (PVC) and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water — Specification (*first revision*) |
| IS 10910 : 1984 | Specification for polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water |
| IS 10951 : 2020 | Specification for polypropylene (PP) materials for moulding and extrusion (*second revision*) |
| IS 11434 : 2023 | Ionomer resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water — Specification (*first revision*) |
| IS 11704 : 2023 | Ethylene acrylic acid (EAA) copolymers for their safe use in contact with food-stuffs, pharmaceuticals and drinking water — Specification (*first revision*) |
| IS 12247 : 2024 | Specification for Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water (*first revision*) |
| IS 12252 : 2017 | Polyalkylene terephthalates (PET and PBT), their copolymers and list of constituents in raw materials and end products for their safe use in contact with foodstuffs and pharmaceuticals (*first revision*) |
| IS 13193 : 1992 | Polyalkylene terephthalate (PET and PBT) for moulding and extrusion — Specification |
| IS 14534 : 2023 | Plastics — Recovery and recycling of plastics waste — Guidelines (*second revision*) |
| IS 15495 : 2020 | Printing ink for food packaging — Code of practice (*first revision*) |
| ISO 18856 : 2024 / ISO 19007 : 2018 | Water quality — Determination of selected phthalates using gas chromatography/mass spectrometry |
| ISO 18857-2 : 2009 | Water quality — Determination of selected alkylphenols — Part 2: Gas chromatographic-mass spectrometric determination of alkylphenols, their ethoxylates and bisphenol A in non-filtered samples following solid-phase extraction and derivatisation |

**ANNEX B**

(*Foreword*)

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 10325 : 2000 | Square tins — 15 kg/litre for *ghee, vanaspati*, edible oils and bakery shortenings — Specification (*second revision*) |
| IS 10339 : 2000 | *Ghee*, *vanaspati,* edible oils tins up to 10 kg/litre capacity — Specification (*second revision*) |
| IS 10840 : 1994 | Blow moulded HDPE containers for packing of *vanaspati —* Specification (*second revision*) |
| IS 11352 : 2018 | Flexible pouches for the packing of *vanaspati* up to 2 kg or 2 litres — Specification (*third revision*) |
| IS 14129 : 1994 | Flexible packaging materials for the packing of *vanaspati* in 10 kg and 15 kg packs — Specification |
| IS 14319 : 1995 | Laminated paper board pack for *vanaspati* — Specification |

**ANNEX C**

(*Clauses* 4.5 *and* 7.2)

**C-1 GENERIC REQUIREMENTS**

**C-1.1****Material Requirements**

**C-1.1.1** All components of the PET containers that meet the requirements specified in the relevant section(s) of **4** at the approval stage shall be maintained in the same quality by the supplier in all subsequent supplies.

**C-1.1.2** While specifications have been identified at various places, all components that come in contact with the contents of the containers, shall be in compliance with the appropriate Indian Standards for food contact materials (FCM) as available.

**C-2 SUSTAINABILITY REQUIREMENTS**

**C-2.1** All components of the container should be in compliance with the stipulations placed in the *PWM Rules*, such as:

* All components of the container, singly and together, lending themselves to recycling or recovery.
* The container shall be designed to facilitate collection and/or return into the supply chain for recycling, recovery or reuse.

NOTE — The term ‘components’ used in this Standard includes the PET container and all other associated parts such as the caps, wad, label, etc., some of which may not come in contact with the contents.

* The material for the PET container should not contain any additive for biodegradability or compostability to ensure recyclability.

**C-3 BRIMFUL CAPACITY**

**C-3.1** The brimful capacity shall exceed the nominal capacity as follows:

1. Firstly, nominal capacity (N) shall be decided.
2. The permissible tolerance (± X) for the desired nominal capacity as laid in Table 1 of Schedule I, Rule 2(e) of *Legal Metrology (Packaged Commodity) Rules*, 2011 shall be noted.
3. The tolerance shall be added to the nominal capacity (N + X).
4. Next, note that the brimful capacity will have its own tolerance limits (± Y).
5. Hence the minimum brimful capacity will be (N + X + Y) subject to fulfilling the requirement that, when the bottle is held by hand, the contents are still below the brim.

**C-3.2** The maximum brimful capacity (Z), however, can vary depending upon the properties of the content (e.g. specific gravity) and the wide variety possible in the container design and format.

**C-3.3** Hence N, Y and Z shall be agreed to between the manufacturer and the purchaser.

**ANNEX D**

 (*Clause* 10.4)

**ADDITIONAL REQUIREMENTS FOR ECO-MARK**

**D-1 GENERAL REQUIREMENTS**

**D-1.1** All the packaging material/package manufactured shall meet relevant standards of BIS (Bureau of Indian Standards) pertaining to safety, quality, and performance wherever applicable.

**D-1.2** The manufacturer of packaging material/package must produce the consent clearance as per the provisions of *Water (Prevention and Control of Pollution) Act*, 1974 and *Air (Prevention and Control of Pollution) Act*, 1981 along with the authorisation, if required, under the *Environment (Protection) Act*, 1986 and the rules made thereunder to BIS while applying for ECO-Mark. Additionally, the manufacturer shall also comply with the provisions under *Prevention of Food Adulteration Act*, 1954 and rules made thereunder, wherever necessary.

**D-1.3** The packaging material/package may display in brief the criteria based on which the product has been labelled as Environment Friendly.

**D-1.4** The packaging material/package may be sold along with instruction for proper use and mode of safe disposal so as to maximise product performance and minimise wastage.

**D-1.5** It shall also be suitably mentioned that ECO-Mark label is applicable only to the packaging material/package if content is not separately covered under ECO-Mark. It may be stated that the ECO-Mark is applicable to the product or packaging material or both.

**D-2 PRODUCT SPECIFIC REQUIREMENTS**

**D-2.1** The plastic packaging materials/packages used for packaging of food, pharmaceutical, cosmetics and drinking water shall comply with the relevant Indian standards and shall be manufactured from the plastics which shall comply with relevant Indian Standards.

NOTE — The manufacturer shall provide documentary evidence by way of certificate or declaration to this effect to Bureau of Indian Standards while applying for ECO-Mark.

**ANNEX E**

(*Clause* 11)

**SAMPLING**

**E-1 SCALE OF SAMPLING**

**E-1.1 Lot**

In any consignment all the containers of the same material, nominal capacity and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

**E-1.2 Scale of Sampling**

For ascertaining the conformity of the lot to the requirements of this standard, tests shall be carried out for each lot separately. The number of containers to be sampled from a lot shall be in accordance with Table 2.

**Table 2 Scale of Sampling and Acceptance Number**

(*Clauses* E-1.2, E-2.1, E-2.3 *and* E-2.4)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No.** | **Lot Size** | **For Visual Examination****(*Clause 5.1.2*)** | **For Closure Leakage Test (*Clause 9.1*)** | **For Wall Thickness, Ink Adhesion, Product Resistance and Migration Test** **(*Clauses 6.2, 9.5, 9.6 and 9.7*)** |
| Sample Size | Acceptance Number | Sample Size | Acceptance Number | No. of Samples | Acceptance Number |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|  | Up to 500 | 13 | 1 | 5 | 0 | 2 | 0 |
|  | 501 to 1 000 | 20 | 2 | 8 | 0 | 2 | 0 |
|  | 1 001 to 3 000 | 32 | 3 | 13 | 0 | 2 | 0 |
|  | 3 001 to 5 000 | 50 | 5 | 20 | 1 | 3 | 0 |
|  | 5 001 and above | 80 | 7 | 32 | 2 | 5 | 0 |

NOTES

1. “Acceptance Number” mentioned in Table 2 and in Clauses E-2.1 & 2.3 refers to the number of acceptable failures for a given sample size.
2. For details on the significance of the columns and other parameters, paragraphs given in E-2 below may be referred.

**E-1.3** The containers shall be selected at random from the lot. To ensure the randomness of selection, methods given in 4905 may be followed.

**E-2 CRITERIA FOR CONFORMITY**

**E-2.1 Visual Examination**

The sample containers selected as per col (3) of Table 2 shall be examined for manufacturing conditions (**5.1.2**). Any containers failing in one or more of the requirements shall be termed as defective. The lot shall be accepted under this head, if the number of defective containers in sample does not exceed the acceptance number given in col (4) of Table 2.

**E-2.2 Brimful Capacity, Container Mass and Mass of Handle and Lid**

For the purpose of above tests, five containers for lot size up to 5 000 and 10 containers for lot size above 5 000 shall be selected at random from the samples already drawn according to **E-1.3**. Each of the sample containers shall be subjected to tests for brimful capacity (**7.2**), container mass (**8.1**), and the mass of lid and handle (**8.3**). There shall be no failure if the lot is to be accepted under this clause.

**E-2.3 Test for Closure Leakage**

The number of sample containers to be drawn shall be in accordance with col (5) of Table 2. Each of the sample containers shall be subjected to closure leakage test. The number of failures shall not exceed the acceptance number given in col (6) of Table 2.

**E-2.4 Wall Thickness, Ink Adhesion, Product Resistance and Migration**

The sub-sample size as given in col (7) of Table 2 shall be subjected to tests for wall thickness, handle pull test ink adhesion, product resistance and migration tests. No failures shall occur for acceptance of the lot under this clause.

**E-2.5 Drop Impact Test, Stack Load Test and Handle Pull Test**

One set of sample container as given in the test methods (**9.2**, **9.3** and **9.4**) shall be drawn from the lot and these shall be subjected to the respective tests. The sample shall pass the tests for acceptance of the lot in respect of drop impact and stacking requirements.

**ANNEX F**

(*Foreword*)

 **COMMITTEE COMPOSITION**

#### Plastics Packaging Sectional Committee, PCD 21

|  |  |
| --- | --- |
| *Organization* | *Representative(s)* |
| Indian Institute of Packaging, Mumbai | DR BABU RAO GUDURI **(*Chairperson*)** DR. ATUL JADHAV |
| All India Food Processors Association, (AIFPA) New Delhi | SHRI AKALESH SHARMA |
| All India Plastics Manufacturers Association (AIPMA), Mumbai | SHRI KAILASH B. MURARKA  SHRI KISHORE SAMPAT (*Alternate)* |
| Bisleri International Pvt Ltd, Delhi | SHRI K. GANESH SHRIMATI SALONI CHADHA (*Alternate)* |
| Coca-Cola India, Gurugram  | SHRI VIRENDRA LANDGE SHRI RAJENDRA DOBRIYAL (*Alternate )* |
| Central Institute of Plastics Engineering & Technology (CIPET), Chennai | DR S. N. YADAV SHRI K. A. RAJESH (*Alternate)* |
| Chemicals & Petrochemicals Manufacturers Association (CPMA), New Delhi  | SHRI UDAY CHAND |
| Chemco Plastic Industries Private Ltd, Mumbai | SHRI GAURAV SARAOGI SHRIMATI RUPANDE SAMPAT (*Alternate)* |
| CSIR-Central Food Technological Research Institute (CFTRI), Mysore  | SHRI RAJESHWAR MATCHE DR ARUN KUMAR P. SELVAM  (*Alternate)* |
| CSIR-Indian Institute of Toxicology Research, Lucknow | DR V. P. SHARMA  DR A.B. PANT (*Alternate)* |
| Essel Propack Limited, Vasind | SHRI HARIHARAN K DR GURUNATH (*Alternate)* |
| Federation of Indian Packaged Drinking Water Manufacturers Association (FIPMA), Mumbai | SHRI APURVA DOSHI |
| Foundation for Innovative Packaging and Sustainability (FIPS), Mumbai | SHRI M K BANERJEE |
| GAIL (India) Limited, New Delhi | SHRI GOPAL DAYAL SHRI V B SINGH (*Alternate*)) |
| Haldia Petrochemicals, Kolkata | SHRI SUVOMOY GANGULY SHRI T R SRIKANTH RAMANI (*Alternate* I*)* SHRIMATI SUMAN HEMBRAM (*Alternate* II*)* |
| HPCL- MITTAL Energy Limited (HMEL), Noida | SHRI VINEET K GUPTA SHRI ALAKESH GHOSH (*Alternate)* |
| Indian Centre for Plastics in the Environment (ICPE), Mumbai  | SHRI T.K. BANDOPADHYAY  SHRIMATI NEHA MAURYA (*Alternate*) |
| Indian Flexible Packaging & Folding Carton Manufacturers Association (IFCA), Mumbai  | SHRI ATIN CHAUDHARY  |
| Indian Oil Corporation Limited (IOCL), New Delhi  | SHRI DHANANJAY SAHOO  SHRI SUMIT BASU (Alternate I) SHRI PONNUSWAMY K. (Alternate II) SHRI RAJA PODDAR (Alternate III) |
| Mother Dairy Fruit & Vegetable Pvt. Ltd., Noida  | SHRI KALPAM CHAUHAN  |
| Nestle India Limited, Gurugram | SHRIMATI SARITA DEVI |
| PET Packaging Association for Clean Environment (PACE), New Delhi | DR VIJAY HABBU SHRI PANKAJ UPPAL (*Alternate)* |
| Pigeon India, Greater Noida | SHRI GOPAL SHARMA SHRIMATI SNEHA GUPTA (*Alternate)* |
| Presto Stantest Pvt. Ltd., Faridabad | SHRI VISHAL MALHOTRA SHRI GAURAV MALHOTRA (Alternate) |
| Reliance Industries Ltd, Mumbai | SHRI S.V. RAJU DR SHREERAM WADEKAR (*Alternate* I*)* SHRI JAYAKRISHNAN VENUGOPALAN (*Alternate* II*)* |
| Shriram Institute for Industrial Research, Delhi | SHRI SANJAY KUMAR SINGH  DR. MUKTI TYAGI (Alternate) |
| Skypack India Pvt. Ltd. Faridabad | SHRI NAVEEN TALWAR |
| Sun Pharmaceutical Industries Ltd., Gurugram | SHRI SHANTANU CHOWDHARY |
| Uflex Limited, Noida  | SHRI RAHUL DUBEY SHRI JEEVRAJ PILLAI (*Alternate)* |
| Voluntary Organization in Interest of Consumer Education (VOICE),  New Delhi | SHRI M.A.U. KHAN DR RAJIV JHA (*Alternate)* |
| Personal Capacity, *140-Tea Estate, Lane 18, Banjarawala, Dehradun-248001* | DR YUVRAJ SINGH NEGI |
| BIS Director General | SHRI CHINMAY DWIVEDI, SCIENTIST ‘E’/ DIRECTOR AND HEAD (PCD) [REPRESENTING DIRECTOR GENERAL (*Ex-Officio*)] |
| *Member Secretary* MS ANMOL AGARWALSCIENTIST B/ASSISTANT DIRECTOR (PETROLUEM, COAL AND RELATED PRODUCTS), BIS |