

SRI LANKA STANDARD 871 : PART 5 : 1992

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**CODE FOR USE OF PLASTIC MATERIALS FOR
FOOD CONTACT APPLICATIONS**

PART 5 – POLYETHYLENE PHTHALATE (PET)

SRI LANKA STANDARDS INSTITUTION

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SLS 871 : 1992

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SRI LANKA STANDARDS INSTITUTION

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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
CODE FOR USE OF PLASTIC MATERIALS FOR
FOOD CONTACT APPLICATIONS

PART 5 : POLYETHYLENE PHTHALATE (PET)

FOREWORD

This Standard was approved by the Sectoral Committee on Plastics was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1992 - 12 - 17.

Plastics are widely used in the manufacture of food packaging materials, food utensils and components of food processing equipment. The plastic materials used for food contact applications are referred to as "food grade" plastics. It is generally accepted that the high molecular weight of polymers makes them essentially inert and insoluble in food and therefore do not pose toxic hazards. However, polymers may contain residues of monomers, low molecular weight polymers, processing aids and substances which are added to the polymer to modify its physical, mechanical or other properties during processing or usage. These residues may migrate into the food which is in contact with the polymer. Therefore, it is essential that the plastic materials and other additives used be such that any migration into the food from such materials is minimized.

The extent to which the migration occurs is dependent on the type of plastic, contact area, rate of transfer of compounds, duration of contact and the type of food which is in contact with the plastic materials.

Good manufacturing practices should be followed throughout the manufacturing process, supply and usage of plastic materials for food contact applications.

This part is one of a series of standard codes for use of plastic materials for food contact applications. Other parts in the series are:

- Part 1 : General guidelinee for manufactre;
- Part 2 : Polyvinyl chloride (PVC);
- Part 3 : Polyethylene (PE) ; and
- Part 4 : Polypropylene (PP).

This part covers polymers, processing aids and additives permitted for use in the manufacture and processing of polyethylene phthalate plastics for food contact applications. All permitted substances used should be of high standard of purity.

The users of polyethylene phthalate plastics for food contact applications are advised that a written assurance or where necessary, a test report be requested from the suppliers to ensure that the material contains only the permitted ingredients specified in this code. It should be noted that substances specified under permitted additives may have been incorporated in the polymer as supplied by the manufacturer in compliance with the specified levels. Therefore, formulators or processors intending to use additives in the polymers should take care, not to exceed the maximum level of use specified in this code.

Inclusion of additional substances to be used in the manufacture and processing of polyethylene phthalate plastics would be considered as and when required provided that the safe use of such substances is established by the toxicological and migration studies.

In the preparation of this code the assistance derived from the following publication is gratefully acknowledged:

Plastics for Food Contact Applications, revised edition 1986, The British Plastic Federation and The British Industrial Biological Research Association.

1 SCOPE

1.1 This code prescribes the polymers, manufacturing aids and additives permitted in polyethylene phthalate (PET) used for food contact applications.

1.2 The permissible limits for residual monomers, manufacturing aids and additives present in the finished polymer/ final compounds are also specified.

1.3 Polyethylene phthalate plastics intended for use in drug contact applications, medical preparations, and toiletry products and pipes and fittings for water supply are not covered by this code.

2 REFERENCES

- SLS 616 Glossary of terms for plastics.
SLS 871 Code for use of plastic materials for food contact applications
Part Colorants.*

* Under preparation

3 DEFINITIONS

For the purposes of this code, the definitions given in SLS 616 shall apply.

4 REQUIREMENTS

4.1 Composition of polyethylene phthalate

Polyethylene phthalate shall be manufactured from polymers specified in 4.2 such that the finished polymer contains not less than 50 per cent of structural moieties derived from terephthalic acid and conforms to the requirements given in 4.1.1, 4.1.2 and 4.1.3.

4.1.1 The finished polymer shall not contain ingredients or residues of ingredients other than those specified in 4.3 and 4.4.

4.1.2 The finished polymer shall have residual monomers at the minimum level achievable by good manufacturing practice.

4.1.3 The finished polymer shall comply with the extractability requirements given in Table 1 when the food contact surface is exposed to the solvents under the conditions given in Column 3 of the table.

Table 1 Extractability requirements for polyethylene phthalate

Sl No.	Food contact Application	Solvent and test conditions	Chloroform-soluble extractable material, mg/dm ² , max.
(1)	(2)	(3)	(4)
i	Non-alcoholic beverages at a temperature not exceeding 121 °C	a) Distilled water at 121°C for 2 h.	7.8
		b) n-heptane at 66 °C for 2 h.	7.8
ii	Alcoholic beverages having not more than 50% alcohol by volume	a) Distilled water at 121 °C for 2 h	7.8
		b) Ethanol 50%, by volume, at 49 °C for 24 h.	7.8
iii	Oven cooking or baking at temperatures above 121 °C	a) Distilled water at 121 °C for 2 h	0.3
		b) n-heptane at 66 °C for 2 h	0.3

4.2 Permitted polymers

4.2.1 Condensation products of ethylene glycol or butanediol 1,4 with terephthalic acid, isophthalic acid or azelaic acid or their dimethyl esters.

4.3 Permitted manufacturing aids

4.3.1 Catalysts

The finished polymer may contain residues of oxidised compounds of the elements given in Table 2 upto the maximum limits specified therein.

Table 2 Residues of catalysts

Sl No. (1)	Element (2)	Maximum limit of residue, as element, mg/kg (3)
i	Antimony	350
ii	Calcium	---
iii	Cobalt	50
iv	Gallium	20
v	Germanium	100
vi	Lithium	130
vii	Manganese	80
viii	Phosphorus	---
ix	Titanium	120
x	Zinc	80

4.4 Permitted additives

4.4.1 Colorants

Colorants used shall conform to SLS 871 : Part Colorants*

4.4.2 Other additives

Any additive given in Table 3 may be present upto the maximum limit specified therein.

* Under preparation.

Table 3 - Additives that may be used in polyethylene phthalate

Sl No.	Chemical Name or type	Maximum level of use in final compound %, m/m	Food type	Form of product
(1)	(2)	(3)	(4)	(5)
i	Carbon black	5	All*	All**
ii	Di-iso-butyl phthalate	2	All	All
iii	Kaolin	3	All	All
iv	Silicon dioxide	10	All	All
v	Sodium salicylate	0.5	All	All
vi	Titanium oxide	20	All	All

* "All" indicates that additive may be used to formulate materials suitable for contact with all types of food stuffs.

** "All" indicates that additives may be used in formulation for the manufacture of all types of food contact products.

5 MARKING

All packages containing polyethylene phthalate shall be marked legibly and indelibly with the following :

- a) The words "Polyethylene phthalate" or "PET";
- b) The words "Food grade";
- c) Any restrictions for use;
- d) The name and address of the manufacturer and country of origin;
- e) Trade mark and/or brand name if any; and
- f) Batch or code number.

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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

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Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.

