इंटरनेट मानक

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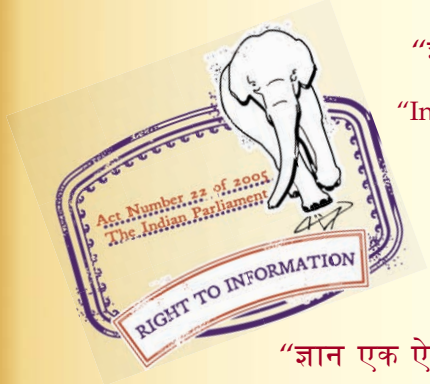
"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 10909 (2001): Positive List of Constituents of Polypropylene and its Copolymers in Contact with Foodstuffs, Pharaceuticals and Drinking Water [PCD 12: Plastics]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

खाद्य सामग्री, औषधियों और पेय जल के सम्पर्क में पोलीपरोपाइलीन और इसके कोपॉलिमर के संघटकों की निश्चित सूची

(पहला पुनरीक्षण)

Indian Standard

POSITIVE LIST OF CONSTITUENTS OF POLYPROPYLENE AND ITS COPOLYMERS IN CONTACT WITH FOODSTUFFS, PHARMACEUTICALS AND DRINKING WATER

(First Revision)

ICS 67.250;83.080.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 2001

Price Group 4

FOREWORD

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

Plastics are being used on a large scale for packaging of foodstuffs, pharmaceuticals and drinking water. Where direct contact occurs between the packed commodity and the plastics, the high-molecular mass polymer itself does not pose a toxic hazard being inert and essentially insoluble in food. There is, however, a likelihood that migration of polymer additives, adventitious impurities, such as monomers, catalyst remnants and residual polymerization solvents and of low molecular mass polymer fraction will occur from the plastics into the packaged material with consequent toxic hazard to the consumers of products packed in plastics. The occurrence of acute toxicity due to plastics materials in contact with food is most unlikely, since only trace quantities of potentially toxic materials are likely to migrate. However, the accumulation of these materials with time may lead to health hazards.

This standard was first published in 1984. With the availability of newer, efficient and cost effective additives which can be safely used in contact with foodstuffs, pharmaceuticals and drinking water, the concerned Technical Committee has decided to revise this standard to incorporate more additives. In this revision, the following changes have been made:

a) Two amendments issued to this standard have been incorporated;

b) The permitted list of additives has been enlarged; and

c) The additives have been brought under the heading of auxiliary items for working instead of prescribing under various heads like lubricants, antioxidants, ultra-violet absorbers, anti-blocking agent, etc, which is the practice being following until now.

The additives prescribed in this standard are based on information available from British Plastics Federation (BPF), British Industrial Biological Research Association (BIBRA), FDA Regulations (USA), and EEC Directives.

This standard is intended to be used with the series of Indian Standards on plastics for food contact applications which is given in Annex A.

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

Indian Standard

POSITIVE LIST OF CONSTITUENTS OF POLYPROPYLENE AND ITS COPOLYMERS IN CONTACT WITH FOODSTUFFS, PHARMACEUTICALS AND DRINKING WATER

(First Revision)

1 SCOPE

1.1 This standard covers positive list of constituents of polypropylene, namely the homopolymers, and copolymers manufacturing residues and necessary additives, which may be regarded as safe for use, when properly processed, in contact with foodstuffs, pharmaceuticals and drinking water and when present only in the prescribed limits of concentration.

1.2 It does not purport to establish the suitability of the ingredient singly in a particular foodstuff, pharmaceutical or drinking water from other than toxicological considerations.

2 REFERENCE

The following standard contains provisions which, through reference in this text, constitute provisions of the standard. At the time of publication, the edition indicated was 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 the standard indicated below:

IS No.	*Title*
9833 : 1981	List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water

3 TERMINOLOGY

3.1 Polypropylene — shall mean:

a) homopolymers of propylene;

b) copolymers of propylene with ethylene and/or one or more alkene-1-olefines containing C_4 to C_8. The propylene content must constitute not less than 50 percent by mass and monomers with C_4 to C_8 shall constitute not more than 15 percent by mass;

c) blends of homopolymers listed in **3.1** (a) with one or more of the copolymers listed under **3.1** (b);

d) blends of several copolymers listed in **3.1** (b); and

e) blends of polymers listed in **3.1** (a) to (d) with polyisobutylene, butyl rubber, and/or polyethylene such that the propylene content, of the blend is not less than 50 percent by mass and each of the component complies with laid down specification relating to that component.

4 REQUIREMENTS

4.1 Basic Resin

The homopolymer and copolymers defined in **3** shall be made in such a way that they contain no ingredients or residues of ingredients used in their manufacture other than those listed in **4.2**.

4.2 Process Residue

Polypropylene shall contain not more than a total of 0.2 percent by mass of the following when measured by agreed assay technique:

a) Titanium;

b) Aluminium;

c) Sodium carbonate;

d) Potassium carbonate;

e) Sodium chloride;

f) Potassium chloride;

g) Other chlorides;

h) Petroleum hydrocarbon fractions; and

j) Magnesium, ziroconium, vanadium, benzoates, ethoxides/alkoxides, and C_1 to C_5 alcohols.

5 AUXILLARY ITEMS FOR WORKING

5.1 The auxiliary items prescribed in Table 1 may be used to maximum level, percentage weight/weight, of the final product in polypropylene polymers given in **3.1**.

5.2 Pigments and Colourants

The pigments and colourants used shall comply with list and limits prescribed in IS 9833.

Table 1 Auxiliary Items
(*Clause* 5.1)

Chemical Name	Maximum Level of Use Percentage Weight/Weight of Final Product
(1)	(2)
Aluminium silicate	50
Aluminium stearate	3
Behenic acid	1
Benzene propanoic acid 3-(1, 1-dimethyl ethyl)-β (3,1-dimethylethyl)-4 - hydroxyphenyl-4-hydroxy-β methyl-1, 2-ethanediyl ester	0.5
1, 4-Benzenedicarboxylic acid, bis [2-(1, 1-dimethyl ethyl)-6-{[3-(1,1-dimethylethyl)-2-hydroxy-5-methyl phenyl [methyl]}-4-methyl phenyl] ester	0.075
β,3(or4)-Bis(octadecylthio)cyclohexylethane	0.3
2, 6 Bis (1-methyl heptadacyl)-p-cresol	0.3
3,9-Bis[2-{3-(3-*tert*-butyl-4-hydroxy-5-methylphenyl) propionyloxy}-1,1-dimethylethyl]-2,4,8,10-tetraoxaspiro[5,5] undecan	0.3
5,7-Bis1,1-dimethylethyl-3-hydroxi-2(3H)-benzofuranone, eaction products with o-xylene	0.02
Bis(p-ethylbenzylidene)sorbitol	0.3
4,4-Bis (a, a dimethyl benzyl) diphenylamine	0.3[1)]
2, 5 Bis 5'-*tert*-butylbenzoxaly (2) thiophene	0.02[1)]
Bis (2, 4-di-*tert*-butyl phenyl) pentaerythritol diphosphite with upto 1% tri-isopropanolamine	0.01
2-(3'-*Tert*-butyl-2'-hydroxy-5'-methyl-phenyl)-5-chloro-benzotriazole having melting range of 137-141°C	0.5
N,N-Bis (2-hydroxyethyl) alkyl (12-C18) amine	0.1
Bis [2,2' methylene bis 4 methyl G-tert butyl phenol] terephthalate	0.1
Butylated hydroxyanisole	0.05
Butylated hydroxytoluene	0.2
Butyl lactate	5
n-Butyl stearate	5
Butyric acid, 3,3-bis (3-*tert*-butyl-4-hydroxyphenyl) ethylene ester	0.5
Calcium benzoate	2
Calcium carbonate	25
Calcium bis [monoethyl 3,5-di-*tert*-butyl-4-hydroxybenzyl phosphonate]	0.2
Calcium hydroxide	0.1
Calcium perlargonate	—
Calcium octoate	1.5
Calcium oxide	10
Calcium oxide dispersion	20
Calcium palmitate	5
Calcium stearate	5
Carbon black	5
Cyclic neopentanetetrayl bis (octadecyl phosphite)	0.25
4,4' Cyclohexylidenebis (2-cyclohexyl phenol)	0.1
Citric acid monohydrate	0.01
Dibenzylidene sorbitol	0.25
2,6 Di-*tert*-butyl-4-ethyl phenol	0.01[2)]
2,6-di(α-methyl benzyl)-4-methyl phenol	0.2
3,5-*Di-tert*-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris(2-hydroxyethyl)-5-triazine-2,4,6-(1H, 3H, 5H) trione	0.5
Di-tert-butylphenyl phosphonite condensation with biphenyl	0.1
2,4-*Di-tert*-butylphenyl-3,5-*di-tert*-butyl-4-hydroxy-benzoate	0.5[1)]
3,5-*Di-tert*-butyl-4-hydroxy hydrocinnamic acidtriester with 1,3,5-tris (2-hydroxy ethyl)-5-triazine-2,4,6-(1H, 3H, 5H) trione	0.5
Dilauryl thiodipropionate	1.0

Table 1 (*Continued*)

Chemical Name	Maximum Level of Use Percentage Weight/Weight of Final Product
(1)	(2)
2,4, dimethoxy-6-(1-pyrenyl)-8-triazine dimethylidibenzylidene sorbitol	0.02
Disteryl thiodipropionate	1.0
2,4-Dimethoxy-6-(-1-pyrenyl)-S-triazine	0.01
Dimethyl succinate 2-(4-hydroxy 2,2,6,6-tetramethyl 1-piperidyl) ethanol polycondensate	0.3
Distearyl pentaerythritol diphosphite	0.3
2,4 Di-*tert*-pentyl-6 1-(3,5-di-tert-pentyl-2-hydroxy phenyl) ethyl phenyl acrylate	0.2
N, N' Distearoyl ethylenediamine	5
n-Dodecanol	2
Dolomite	2[3)]
Di-tert-butylphenyl phasphonite condensation product with bisphenol/M.P.85 to 110 °C.	0.1
Erucamide	0.2
2-Ethoxy-5-terthutyl-2'-ethyl-oxalic acid bisanilid (85-90%) and 2-ethoxy-5-tertbutyl-2'-ethyl-4-*tert* butyl-oxalic acid-bisanilid	0.2
2,2'-Ethylidenebis (4, 6-di-*tert*-butylphenol)	0.05
Fumaric acid	2.5
Glycerine	3.5
Glyceryl oleate	3
Glyceryl stearate	3
Glyceryl ricinoleate	3
Glyceryl triacetate	30
Heavy liquid paraffin	10
Hexadecyl 3,5-*di-tert* butyl-4-hydroxy benzoate	0.5
a-hydroxy-*q*-hydroxy poly (oxyethylene) polyonypropylene	0.2
Hydrotalcite (basic magnesium aluminium carbonate hydrate)	0.3
2-Hydroxy-4-isooctoxy-benzophenone	0.5
2 2'-Hydroxy -3'-tert-butyl-5'-methylphenyl-5-chloro- benzotriazol M.P.126-132	0.5
2-Hydroxy-4-n-octoxy-benzophenone	3.5
Lauric diethanolamide	0.5
Lithium benzoate	0.4
N-Lauroylsarcosine	0.4[4)]
Magnesium benzoate	2
Magnesium oxide	0.05
Magnesium stearate	1
Maleic anhydride grafted polyethylene	10
Mannitol	2.5
2.2'-Methylene bis (4-methyl-6-*tert*-butyl phenol)	0.01
2,2'-Methylene bis 6-(1-methylcyclo-hexyl)-p-cresol	0.2
N,N-Bis (2-hydroxyethyl) alkyl (C12-C18) amine	0.1
7, [2 h Naphtho (1,2-d)triazol-2-yl] 3-phenylcoumarin	0.1
2:1 Nickel Complex of 3,5-*di-tert*-butyl-4-hydroxy-benzyl monoethylphosphate	0.3
n-Octadecyl-B (4'-hydroxy-3'-5' *di tert* butyl phenyl) Propionate	0.5
Oleamide	0.2
Octadecyl hydroxyhydrocinnamate	0.25
Oxidised bis(hydrogenated tallow alkyl) amine	0.05
O,O-di-*n*-Octadecyl 3,5-di-tert-butyl-4-hydroxybenzyl Phosphonate	0.5
2,2'-Oxamidobis[ethyl-3-(3,5-*di-tert*-butyl-4-hydroxyphenyl) propionate]	0.5
Phosphoric acid, cyclic butylethyl propanediol, 2,4,6-*tri-tert*-butylphenyl ester	0.2
Phosphoric acid, cyclic neopentane tetrayl bis(2,4-*di-tert*-butylphenyl) ester	0.1
Phospherous acid cyclic butyl ethyl propanediol, 2,4,6-*tri-tert*-butylphenyl ester	0.2
Pentaerythritol	3
Polyvinyl cyclohexane	0.1
Poly[6-morpholino-s-trizine-2,4-ciyl{2,2,6,6-terramethyl-4-piperidyl)imino)hexamethylene [(2,2,0,6-tetramethyl-4-piperidyl)imino] Polyisobutylene	5
Polydimethyl Siloxane	5
Polyoxyethylene (20) Sorbitan monolaurate	3

Table 1 (*Concluded*)

Chemical Name	Maximum Level of Use Percentage Weight/Weight of Final Product
(1)	(2)
Polyoxyethylene (20) Sorbitan mono-oleate	3
Polyoxyethylene (20) Sorbitan monopalmitate	3
Polyoxyethylene (20) Sorbitan monostearate	3
Polyoxyethylene (20) Sorbitan tristearate	3
Poly [6(1,1,3,3-tetramethyl butyl amino) 1,3,5-triazine -2,4-diyl] [4-(2,2,6,6-tetramethyl-piperidyl) imino]-hexamethylene [4-(2,2,6,6-tetramethyl piperidyl) imino]	0.3
Polypropylene glycol	0.5
Silicon dioxide	10
Sodium alkylsulphonate	2.5
Sodium benzoate	—
Sodium calcium alumino silicate hydrate	—
Sorbitan monolaurate	3
Sorbitan monooleate	3
Sorbitan monopalmitate	3
Sorbitan monostearate	3
Sorbitan trioleate	3
Sorbitan tristearate	3
2-stearamido-ethtyl stearate	3
Sodium di(*p-tert*-butylphenyl) phosphate	0.35
Sodium 2,2'-methylenebis(4,6-*di-tert*-butylphenyl) phosphate	0.3
2-Stearamido-ethyl stearate	3
Stearic/palmitic acid	5
Styrenated *p*-cresol	0.2[5]
Talc	40
Terpolymer of eithylene propylene and 1,4 hexadiene	25
Tetrakis-(2,4-di-tert-butyl-phenyl)-4,4'- biphenylene diphosphonite	0.3
Tetrakis[methylene-3-(3',5'-*di-tert*-butyl-4'-hydroxyphenyl)propionate] methane	0.5
4,4'-Thio-bis (6-*tert*-butyl-*m*-cresol)	0.25
Thiodipropionic acid	0.1
Titanium dioxide	20
α-Tocopherol	—
1,3,5-Trimethyl-2,4,6-tris (3,5-*di-tert*-butyl-4-hydroxy benzyl) benzene	1
Tri (mixed mono and dinonyl phenyl) phosphite	1
1,3,5-Tris (4-*tert*-butyl-3-hydroxy-2,6-dimethyl-benzyl)-1,3,5-triazine 2,,4,6 (1h,3h, 5h)-trione	0.25
1,3,5-tris(3,5-di-*tert*-butyl-4-hydroxyhydrocinnamoyl)hexahydro-s-triazine	0.1
1,3,5-Tris (3,5-*di-tert*-butyl-4-hydroxy-benzyl)-S triazine-2,4,6 (1h, 3h, 5h) trione	0.1
2-[2,4,8,10-tetrakis(1,1-dimethyl)benzo[d,f][1,3,2]-dioxaphosphepin-6-yl]-N,N-bis[2][2,4, 8,10-tetrakis(1,1-dimethylethyl)dibenzo[d,f][1,3,2]dioxaphosphepin-6-yl]oxy]ethyl]ethan amine	0.075
Tris (2, 4, di-*tert*-byutylpheny) phosphite	0.25
Trisodium phosphate	0.1
1,1,3-Tris (2-methyl-4-hydroxy-5-*tert*-butylphenyl) butane	0.25[1]
Vinylidene fluoride/hexa fluoropropylene copolymer	0.05
White soft paraffin	25
Zinc acetate	0.2
Zinc benzoate	2
Zinc *di*-(2-ethylhexanoate)	1.5
Zinc oxide	—
Zinc stearate	3

[1] Non-fatty food only.
[2] Maximum thickness of article in contact with foodstuff, pharmaceuticals and drinking water shall be 0.0635 cm.
[3] Non-acidic food only.
[4] Film only.
[5] Not by food contact above 65°C.

ANNEX A

(Foreword)

LIST OF INDIAN STANDARDS ON PLASTICS SUITABLE FOR USE IN CONTACT WITH FOODSTUFF, PHARMACEUTICALS AND DRINKING WATER

IS No.	*Title*
9833 : 1981	List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water
9845 : 1998	Method of analysis for determination of specific and/or overall migration of constituents of plastics materials and articles intended to come into contact with foodstuffs (*second revision*)
10141 : 2001	Positive list of constituents of polyethylene and its copolymers in contact with foodstuffs, pharmaceuticals and drinking water (*first revision*)
10142 : 1999	Polystyrene (crystal and high impact) for its safe use in contact with foodstuffs, pharmaceuticals and drinking water (*first revision*)
10146 : 1982	Polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10148 : 1982	Positive list of constituents of polyvinyl chloride and its copolymers for safe use in contact with foodstuffs, pharmaceuticals and drinking water
10149 : 1982	Positive list of constituents of polystyrene (crystal and high impact) in contact with foodstuffs, pharmaceuticals and drinking water
10151 : 1982	Polyvinyl chloride (PVC) and its copolymers for pharmaceuticals and drinking water
10171 : 1999	Guide on suitability of plastics for food packaging (*second revision*)
10910 : 1984	Polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
11434 : 1985	Ionomers resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
11435 : 1985	Positive list of constituents of ionomer resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
11704 : 1986	Ethylene/acrylic acid (EAA) copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
11705 : 1986	Positive list of constituents of Ethylene/acrylic acid (EAA) copolymers for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
12229 : 1987	Positive list of constituents of polyalkylene terephthalates (PET & PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
12247 : 1988	Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
12248 : 1988	Positive list of constituents of Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
12252 : 1987	Polyalkylene terephthlates (PET&PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
13449 : 1992	Positive list of constituents of ethylene vinyl acetate (EVA) copolymers in contact with foodstuffs, pharmaceuticals and drinking water
13576 : 1992	Ethylene methacrylic and (EMAA) copolymers and terpolymers for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
13601 : 1993	Ethylene vinyl acetate (EVA) copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
14971 : 2001	Polycarbonate resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
14972 : 2001	Positive list of constituents of polycarbonate resins in contact with foodstuffs, pharmaceuticals and drinking water
14996 : 2001	Positive list of constituents of modified poly (phenylene oxide)

IS No.	*Title*
	(PPO) in contact with foodstuffs, pharmaceuticals and drinking water
14997 : 2001	Modified poly (phenylene oxide) (PPO) resins for their safe use in contact with foodstuffs, pharmaceuticals and drinking water
14998 : 2001	Positive list of constituents of melamine-formaldehyde resins in moulded articles in contact with foodstuffs, pharmaceuticals and drinking water
14999 : 2001	Melamine-formaldehyde moulding materials for its safe use in contact with foodstuffs, pharmaceuticals and drinking water

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Plastics Sectional Committee, PCD 12

Organization	*Representative(s)*
Internet ExchangeNext.com Limited, Mumbai	SHRI SARUP CHOWDHARY (***Chairman***)
Amines and Plasticizers Ltd, Mumbai	SHRI V. V. KULKARNI
	DR R. V. UTEKAR (*Alternate*)
Bakelite Hylam Ltd, Hyderabad	DR C. S. NARASIMHAN
	DR M. BALAKRISHNAN (*Alternate*)
Building Materials and Technology Promotion Council, New Delhi	SHRI J. SENGUPTA
Central Institute of Plastics Engg and Technology, Chennai	DR VIJAI KUMAR
	DR K. PALANIVELU (*Alternate*)
Central Food Technological Research Institute, Mysore	SHRI S. K. KUMAR
	SHRI BALDEV RAJ (*Alternate*)
Gas Authority of India Ltd, Noida	SHRI SHIVAJI BASU
	SHRI V. K. SINGH (*Alternate* I)
	SHRI MANISH KHANDELWAL (*Alternate* II)
GE Plastics India Limited, Gurgaon	GENERAL MANAGER
	DR RASHMI BHARDWAJ (*Alternate*)
Gharda Chemicals Ltd, Thane	DR B. K. DESAI
	DR U. M. VAKIL (*Alternate*)
Gujarat State Fertilizers Company Limited, Vadodara	SHRI B. D. ADHVARYU
	DR Y. P. SINGH (*Alternate*)
Haldia Petrochemicals Ltd, Kolkata	SHRI SHANKAR BANERJEE
	SHRI AMITAVA SANYAL (*Alternate*)
Hindustan Polymers Ltd, Mumbai	SHRI S. V. PARVEEN
	SHRI N. C. DHOCENDRANATH (*Alternate*)
Indian Centre for Plastics in Environment	DR A. N. BHAT
Indian Petrochemicals Corporation Limited, Vadodara	SHRI J. B. KAMAT
	SHRI V. C. FRANCIS (*Alternate*)
Indian Institute of Packaging, Mumbai	SHRI P. V. NARAYANAN
	DR N. G. MOKASHI (*Alternate*)
Indian Plastics Institute, Mumbai	SHRI D. R. PATEL
	SHRI R. K. AGGARWAL (*Alternate*)
Indian Toxicological Research Centre, Lucknow	DR V. P. SHARMA
Jain Irrigation Systems Ltd, Jalgaon	DR H. C. MRUTHYUNJAYA
	SHRI S. B. JOSHI (*Alternate* I)
	SHRI A. P. CHOUDHARI (*Alternate* II)
Larsen & Toubro Ltd, Mumbai	SHRI V. MOHAN
	SHRI R. SUBA RAO (*Alternate*)
Ministry of Defence (R&D), Kanpur	SHRI M. N. SARAF
	DR L. D. KHANDPAL (*Alternate*)
Ministry of Defence, RDSO, Lucknow	Joint Director (Rubber)
	DIRECTOR (SS) (*Alternate*)
Ministry of Health and Family Welfare, DGHS, New Delhi	ADDL DIRECTOR GENERAL (PFA)
	SHRI SUNDAR LAL (*Alternate*)
Ministry of Food Processing Industries, New Delhi	SHRI O. P. GERA
National Chemical Laboratory, Pune	DR S. S. MAHAJAN
	DR S. S. KULKARNI (*Alternate*)
National Dairy Development Board, Anand	DR R. S. LATHANA
	SHRI S. K. KHANDELWAL (*Alternate*)
National Organic Chemical Industries Ltd, Mumbai	SHRI V. K. SHARMA
	SHRI J. K. VADODARIA (*Alternate*)
Nuchem Ltd, Faridabad	DR R. M. MEHTA
Permali Wallace Ltd, Bhopal	SHRI C. C. SAKARDA
	SHRI S. K. KODESIA (*Alternate*)
Reliance Industries Ltd, Mumbai	DR Y. B. VASUDEO
	DR K. S. JADHAV (*Alternate*)
Saint-Gobain Vetrotex India Ltd, Hyderabad	SHRI S. SUNDARAM
	SHRI S. K. GHOSH (*Alternate* I)
	DR B. J. C. BASU (*Alternate* II)
Shivalik Agro-Poly Products Ltd, Parwanoo, H.P.	SHRI ARUN ANAND
	SHRI YOG RAJ KAPUR (*Alternate*)
Shriram Fertilizers & Chemcials, Kota	SHRI M. S. TRIPATHI
	SHRI R. C. GUPTA (*Alternate*)
Shriram Institute for Industrial Research, Delhi	DR R. C. SOOD

(*Continued on page* 8)

(*Continued from page* 7)

Organization	*Representative(s)*
Supreme Petrochem Ltd, Mumbai	SHRI R. RANGARAJAN SHRI B. A. RAKHANGI (*Alternate*)
Tata Engg & Locomotive Co Ltd, Jamshedpur	SHRI U. K. NATH SHRIMATI A. D. SATHE (*Alternate*)
The All India Plastics Manufacturers Association, Mumbai	SHRI R. K. AGGARWAL SHRI K. B. EASWARAN (*Alternate*)
The Plastics & Linoleums Export Promotion Council, Mumbai	SHRI R. P. KALYANPUR
VIP Industries, Mumbai	SHRI SIDDHARTHA ROY SHRI A. S. DALVE (*Alternate*)
XPRO India Ltd, Faridabad	SHRI C. BHASKAR SHRI MANMOHAN KRISHAN (*Alternate*)
BIS Directorate General	SHRI ANJAN KAR, Director & Head (PCD) [Representing Director General *(Ex-officio)*]

Member-Secretary
SHRI T. KALAIVANAN
Joint Director (PCD), BIS

Plastics in Food Packaging and Allied Industries Subcommittee, PCD 12:12

Organization	*Representative(s)*
Central Food Technological Research Institute, Mysore	SHRI K. R. KUMAR (***Convener***)
All India Plastic Industries Association, Delhi	SHRI RAVI KUMAR
AS & T India Limited, New Delhi	SHRI G. D. AGRAWAL
Bakelite Hylam Ltd, Mumbai	DR C. SHANKAR SHRI S. N. MURTHY (*Alternate*)
Britannia Industries Ltd, Bangalore	SHRI G. S. AURORA SHRI M. R. SUNDAR (*Alternate*)
Centre for Processed Food, Bangalore	SHRI R. PRAKASH SHRI CHETAN L. HANCHATE (*Alternate*)
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