

## **Article 7. Standards & Specifications for Equipments, Containers and Packages**

# **Article 7. Standards & Specifications for Equipments, Containers and Packages**

## **1. General Standards**

- 1) Equipment, containers, and packages must be designed to protect food against the chemical and physical contaminations.
- 2) The non-volatile residue may be waived with the standards for the containers or packages having the food-contacting surface which is composed of food-grade materials such as starch and glycerin.
- 3) Solder shall not be used in manufacture or repair of equipment(s), containers, and packages for food products.
- 4) Electrode made of materials other than iron, aluminum, platinum, titanium, and stainless steel shall not be permitted for food-contact use.
- 5) Food-contacting surface of equipments, containers, and packages which are made of copper or copper alloy, must be properly treated with tin coating or its polishing to ensure hygiene safety. Exemption for materials having glossy and non-corrosive characteristics.
- 6) Synthetic coloring agents used in the manufacture of equipment(s), containers, and packages must be permitted as food-approved additives, except in cases where the colorants are added to glazes, glass enamels and porcelain enamels or when the colorants are not mixed into foods.
- 7) Printing inks must be sufficiently dried when they are used in the manufacture of containers and packages. Flexible plastic packages which can alter their shapes depending on the contents shall not contain more than 2 mg/m<sup>2</sup> of toluene. The printed surfaces shall not come into direct contact with food.
- 8) Di-(2-ethylhexyl) phthalate (DEHP or DOP) shall not be used in the manufacture of equipments, containers, and packages, except there is no apprehension that di-(2-ethylhexyl) phthalate migrates into foods.
- 9) Di-(2-ethylhexyl) adipate (DEHA or DOA) shall not be used in the manufacture of wraps or cling sheets.
- 10) Di-n-butyl-phthalate (DBP) and benzyl-n-butyl-phthalate (BBP) shall not be used in the manufacture of baby bottles (including nipples).

## **2. Material Standards**

### **1. Synthetic Polymers**

#### **1-1. Polyvinylchloride (PVC)**

##### **1) Definition**

Polyvinyl chloride is a composite material containing the base polymer made to assure not less than 50% of vinyl chloride.

##### **2) Material Specifications (mg/kg)**

- (1) Lead and cadmium : Not more than 100, respectively
- (2) Vinyl chloride monomer : Not more than 1.0
- (3) Di-butyl tin compound : Not more than 50
- (4) Cresol esters of phosphoric acid : Not more than 1,000

3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0(as lead)
- (2) Potassium permanganate titration : Not more than 10

3) Non-volatile residues : Not more than 30 (not more than 150 if n-heptane is used as the food simulant below 100 °C) ㉔ ㉔

- (4) Diethylhexylphthalate : Not more than 1.5

1-2. Polyethylene(PE) and Polypropylene(PP)

1) Definition

Polyethylene is a composite material containing the base polymer that should be fabricated with 50% or more of ethylene, and polypropylene is a composite material containing the base polymer made to assure not less than 50% of propylene.

2) Material Specifications (mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0(as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30 (not more than 150 if n-heptane is used as the food simulant below 100 °C)

1-3. Polystyrene (PS)

1) Definition

Polystyrene is a composite material containing the base polymer made to assure not less than 50% of styrene or  $\alpha$ -methyl styrene. This provision shall be comprehensive of expanded polystyrenes.

2) Material Specifications(mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively

- (2) Volatile organic compounds : Not more than 5,000 (for expanded polystyrenes of used to boiling water, total weight of volatile material shall be not more than 2,000 and weights of styrene and ethyl benzene are not more than 1,000, individually)

3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0(as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30 (not more than 240 if n-heptane is used as the food simulant below 100 °C)

1-4. Polyvinylidene chloride (PVDC)

1) Definition

Polyvinylidene chloride is a composite material containing the base polymer made to assure not less than 50% of vinylidene chloride.

2) Material Specifications (mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively
- (2) Vinylidene chloride : Not more than 6.0
- (3) Barium : Not more than 100

3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0(as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30

1-5. Polyethyleneterephthalate (PET)

1) Definition

Polyethyleneterephthalate is a composite material containing the base polymer made to assure not less than 50% of copolymers that ethylene glycol reacted with terephthalic acid or dimethyl terephthalate.

2) Material Specifications (mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0(as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30
- (4) Antimony : Not more than 0.05
- (5) Germanium : Not more than 0.1
- (6) Terephthalic acid : Not more than 7.5
- (7) Isophthalic acid : Not more than 5.0

#### 1-6. Phenolformaldehyde (PF)

##### 1) Definition

Phenolformaldehyde is a composite material condensing phenol and formaldehyde.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Non-volatile residues : Not more than 30

(3) Phenol : Not more than 5

(4) Formaldehyde : Not more than 4.0

#### 1-7. Melamineformaldehyde (MF)

##### 1) Definition

Melamineformaldehyde is a composite material containing mainly the condensation polymer of melamine and formaldehyde.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Non-volatile residues : Not more than 30

(3) Formaldehyde : Not more than 4.0

(4) Phenol : Not more than 5

(5) Melamine,2,4,6-triamino-1,3,5-triazine;2,4,6-triamino-s-triazine : Not more than 30

#### 1-8. Ureaformaldehyde (UF)

##### 1) Definition

Ureaformaldehyde is a composite material containing mainly the condensation polymer of urea and formaldehyde.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Non-volatile residues : Not more than 30

(3) Formaldehyde : Not more than 4.0

(4) Phenol : Not more than 5

#### 1-9. Polyacetal(polyoxymethylene(POM), polyformaldehyde)

##### 1) Definition

Polyacetal is a composite material containing the base polymer made to assure not less than 50% of copolymers of formaldehyde and tri-oxymethylene.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Non-volatile residues : Not more than 30

(3) Formaldehyde : Not more than 4.0

#### 1-10. Acrylic Resin

##### 1) Definition

Acrylic resin is a composite material containing the base polymer made to assure not less than 50% of acrylic acid, methacrylic acid, methyl acrylate or methyl methacrylate.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues Not more than 30

(4) Methylmethacrylate : Not more than 15 (in compliance with only the material containing not less than 50% of methylmethacrylate in the base polymer)

#### 1-11. Polyamide/Nylon (PA/Nylon)

##### 1) Definition

Polyamide/Nylon is a composite material containing the base polymer made to assure not less than 50% of lactams or copolymers of diamine and amino carboxylate or dibasic acid.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Caprolactam : Not more than 15

#### 1-12. Polymethylpentene (PMP)

1) Definition

Polymethylpentene is a composite material containing the base polymer made to assure not less than 50% of 4-methylpentene.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30 (not more than 120 if n-heptane used as the food simulant)

1-13. Polycarbonate (PC)

1) Definition

Polycarbonate is a composite material containing the base polymer made to assure not less than 50% of copolymers of bisphenol A and diphenyl carbonate or carbonyl chloride.

2) Material Specifications(mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

(2) Bisphenol A(including phenol and *p*-tertiary butylphenol) : Not more than 500

(3) D-phenylcarbonate : Not more than 500

(4) Amine : Not more than 1.0

3) Migration Specifications(mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Bisphenol A (including phenol and *p*-tertiary butylphenol) : Not more than 2.5

1-14. Polyvinylalcohol (PVA)

1) Definition

Polyvinylalcohol is a composite material containing the base polymer made to assure not less than 50% of vinyl alcohol.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

#### 1-15. Polyurethane (PU)

##### 1) Definition

Polyurethane is a composite material containing the base polymer made to assure not less than 50% of copolymers of isocyanate and polyol.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Isocyanate : Not more than 0.1

#### 1-16. Polybutene-1 (PB-1)

##### 1) Definition

Polybutene-1 is a composite material containing the base polymer made to assure not less than 50% of butene-1

##### 2) Material Specifications(mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications(mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30 (However, in the case that n-heptane is used as the food stimulants, non-volatile residue is not more than 120 for the material using above 100°C, and not more than 150 for using 100°C or lower)

#### 1-17. Polybutadiene (BDR)

##### 1) Definition

Polybutadiene is a composite material containing the base polymer made to assure not less than 50% of 1,3-butadiene (or polymers of 70% or more of 1,2-bond)

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30 (However, in the case that n-heptane is used as the food stimulants, non-volatile residue is not more than 240 for using temperature 100°C or lower)

#### 1-18. Acrylonitrile-butadiene styrene (ABS) and Acrylonitrile styrene (AS)

##### 1) Definition

Acrylonitrile-butadiene styrene is a composite material containing the base polymers that are made of 60% or more of copolymers of styrene (including  $\alpha$ -methylstyrene). Acrylonitrile styrene is a composite material containing the base polymers that are made of acrylonitrile and butadiene rubber dispersed. Acrylonitrile is a composite material containing polymers and AS (acrylonitrile styrene) is a synthetic resin made to contain 50% or more of a polymer consisting of styrene (including  $\alpha$ -methylstyrene) in base polymers.

##### 2) Material Specifications (mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively
- (2) Volatile organic compounds : Not more than 5,000

##### 3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0 (as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30 (However, in the case that n-heptane is used as the food simulants, non-volatile residue is not more than 240 for using temperature 100°C or lower)
- (4) Acrylonitrile : Not more than 0.02

#### 1-19. Polymethacrylstyrene (MS)

##### 1) Definition

Polymethacrylstyrene is a composite material made to assure that the contents of methyl methacrylate and styrene (including  $\alpha$ -methylstyrene) are not less than 20%, respectively, in base polymers and the sum of two chemicals is not less than 60%.

##### 2) Composite Material Specifications (mg/kg)

- (1) Lead and cadmium : Not more than 100, respectively
- (2) Volatile organic compounds : Not more than 5,000

##### 3) Migration Specifications (mg/L)

- (1) Heavy metal : Not more than 1.0 (as lead)
- (2) Potassium permanganate titration : Not more than 10
- (3) Non-volatile residues : Not more than 30 (However, in the case that n-heptane is used as the food simulants, non-volatile residue is not more than 240 for using temperature 100°C or lower)
- (4) Methyl methacrylate : Not more than 15

#### 1-20. Polybutyleneterephthalate (PBT)

##### 1) Definition

Polybutyleneterephthalate is a composite material containing the base polymer made to assure not less than 50% of copolymer of butylene glycol and terephthalate or dimethyl ester of terephthalate.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-21. Polyarylsulfon (PASf)

1) Definition

Polyarylsulfon is a composite material containing the base polymer made to assure not less than 50% of 4,4'-dichlorodiphenylsulfon or co-polymer of 4,4'-dichlorodiphenylsulfon and aromatic bisphenol.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-22. Polyarylate (PAR)

1) Definition

Polyarylate is a composite material containing the base polymer made to assure not less than 50% of copolymers of 2,2-bis(4-hydroxyphenyl)propane and terephthalic acid or isophthalic acid.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-23. Hydroxybutyl polyester (HBP)

1) Definition

Hydroxybutyl polyester is a composite material made to assure not less than 50% of copolymers consisting of hydroxy benzoic acid, aromatic dicarbonate, and aromatic diol in base polymers.

2) Composite Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-24. Polyacrylonitrile (PAN)

1) Definition

Polyacrylonitrile is a material containing the base polymers made to assure not less than 50% of acrylonitrile.

2) Composite Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Acrylonitrile : Not more than 0.02

1-25. Fluoro resins (FR)

1) Definition

Polyarylate is a material containing the base polymer made to assure not less than 50% of fluoro-containing monomers.

2) Composite Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues: Not more than 30

1-26. Polyphenyleneether (PPE)

1) Definition

Polyphenyleneether is a material containing the base polymer made to assure not less than 60% of copolymer of 2,6-dimethyl phenol and styrene.

2) Composite Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

(2) Volatile organic compound : Not more than 5,000

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-27. Ionomer resin

1) Definition

Ionomer is a material made by the copolymerization of ethylene and methyl acrylic acid, in which zinc or ion is cross-linked to carboxyl group.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-28. Ethylenevinylacetate (EVA)

1) Definition

Ethylenevinylacetate is a material made by the copolymerization of a ethylene and vinylacetate.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0(as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-29. Methylmethacrylate-acrylonitrile-butadiene-styrene (MABS)

1) Definition

Methylmethacrylate-acrylonitrile-butadiene-styrene is a composite material containing the base polymer made to assure not less than 60% of copolymer of methacrylate, acrylonitrile, butadiene, and styrene (including  $\alpha$ -methylstyrene).

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

(2) Volatile organic compound : Not more than 5,000

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Methyl methacrylate : Not more than 15 f

(5) Acrylonitrile : Not more than 0.02

1-30. Polyethylenenaphthalate (PEN)

1) Definition

Polyethylenenaphthalate is a composite material containing the base polymer made to assure not less than 50% of copolymers of 2,6-dimethyl naphthalene dicarboxylate(NCD) and ethylene glycol.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-31. Silicone Resin

1) Definition

Silicone is a composite material containing the base polymers made to assure not more than 50% of bridged-siloxane resin (methyl hydrogen polysiloxane, di-methyl polysiloxane, methylphenyl polysiloxane, and others are bridged with dibutyltin dilaurate, stannous oleate, tetra-butyl-titanate, and others).

2) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

### 1-32. Epoxy Resin

#### 1) Definition

Epoxy resin is a composite material made of copolymers mainly bisphenol A and epichlorohydrine.

#### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

(2) Amines : Not more than 1.0

#### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Bisphenol A(including phenol and *p*-tertiary butylphenol) : Not more than 2.5

(5) Bisphenol A diglycidyl ether (including bisphenol A diglycidyl ether dichloride and bisphenol A diglycidyl ether dihydrate): Not more than 1.0

(6) Bisphenol F diglycidyl ether (including bisphenol F diglycidyl ether dichloride and bisphenol F diglycidyl ether dihydrate): Not more than 1.0

(7) Epichlorohydrin : Not more than 0.5

### 1-33. Polyetherimide

#### 1) Definition

Polyetherimide is a composite material containing the base polymer made to assure not less than 50% of copolymer of m-phenylenediamine and bisphenol A dianhydride.

#### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

(2) Bisphenol A(including phenol and *p*-tertiary butylphenol) : Not more than 500

#### 3) Migration Specifications(mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Bisphenol A(including phenol and *p*-tertiary butylphenol) : Not more than 2.5

### 1-34. Polyphenylene Sulfide (PPS)

#### 1) Definition

Polyphenylene sulfide is a composite material containing the base polymer made to assure not less than 50% of copolymers of p-dichlorobenzene and sodium sulfide.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-35. Polyethersulfone (PES)

1) Definition

Polyethersulfone is a composite material containing the base polymer made to assure not less than 50% or more of copolymers of 4,4'-dichlorodiphenylsulfone and 4,4'-dihydroxyphenylsulfone.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1-36. Poly(cyclohexane-1,4-dimethylene terephthalate) (PCT)

1) Definition

Poly(cyclohexane-1,4-dimethylene terephthalate) is a composite material containing the base polymer made to assure not less than 50% of copolymer of 1,4-cyclohexane dimethanol and terephthalic acid or terephthalic acid dimethyl ester.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(4) Antimony : Not more than 0.05

1-37. Ethylene vinyl alcohol (EVOH)

1) Definition

Ethylene vinyl alcohol is a composite material containing the base polymer made to assure not less than 50% of vinyl alcohol.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1—38 Polyimide (PI)

1) Definition

Polyimide is a composite material containing the base polymer made to assure not less than 50% of copolymers of aromatic or aliphatic dianhydride and aromatic or aliphatic diamine.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1—39 Polyetheretherketone (PEEK)

1) Definition

Polyetheretherketone is a composite material containing the base polymer made to assure not less than 50% of copolymers of 4,4'-dihalogenated diphenylketone and bisphenol or hydroquinone.

2) Material Specifications (mg/kg)

(1) Lead and cadmium: Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

1—40 Polylactide (polylactic acid, PLA)

1) Definition

Polylactide is a composite material containing the base polymer made to assure not less than 50% of lactic acid.

2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(However, in the case that starch is present, the specification specified in Article 7-2-9-3

(Migration Specifications, Starch, Specification for Each composite material, Standard and Specification of Utensil and Container-Packaging shall be applied.)

#### 1—41 Polybutylenesuccinate-co-adipate (PBSA)

##### 1) Definition

Polybutylenesuccinate-co-adipate is a material containing the base polymer made to assure not less than 60% of copolymers of succinic acid, adipic acid, and 1,4-butanediol.

##### 2) Material Specifications (mg/kg)

(1) Lead and cadmium : Not more than 100, respectively

##### 3) Migration Specifications (mg/L)

(1) Heavy metal : Not more than 1.0 (as lead)

(2) Potassium permanganate titration : Not more than 10

(3) Non-volatile residues : Not more than 30

(However, if starch is contained, the specification specified in Article 7-2-9-3 (Migration Specifications, Starch, Specification for Each composite material, Standard and Specification of Utensil and Container/Packaging) shall apply.)

## 2. Cellophane: Regenerated Cellulose Film

##### 1) Definition

Cellophane: regenerated cellulose is a thin sheet-like film acquiring from cellulose regenerated the viscosified pulp. And it includes a material acquired by adding or coating substances to achieve technical purposes.

##### 2) Migration Specifications (mg/L)

(1) Arsenic : Not more than 0.1

(2) Heavy metal : Not more than 1.0

(3) Non-volatile residues : Not more than 30

## 3. Rubber

##### 1) Definition

Rubber is a material containing 50% or more of natural rubber or synthetic rubber.

##### 2) Material Specifications

- (1) Lead and cadmium (mg/kg) : Not more than 100 respectively (not more than 10 respectively for nipple)
- (2) 2-Mercaptoimidazol : No detection
- 3) Migration Specifications (mg/L)
  - (1) Phenol : Not more than 5.0
  - (2) Formaldehyde : Not more than 4.0
  - (3) Zinc : Not more than 15 (not more than 1.0 for rubber nipple)
  - (4) Heavy metal : Not more than 1.0 (as lead)
  - (5) Non-volatile residues : Not more than 60 (not more than 40 for rubber nipple)

#### **4. Paper or Processed Paper**

##### **1) Definition**

Paper is made from wood as a main pulp material through the manufacturing process, and processed paper is made from a paper treated by substances to achieve proper technical purpose.

##### **2) Material Specifications (mg/kg)**

- (1) PCBs : Not more than 10

##### **3) Migration Specifications (mg/L)**

- (1) Arsenic : Not more than 0.1
- (2) Heavy metal : Not more than 1.0 (as lead)
- (3) Non-volatile residues : Not more than 30
- (4) Formaldehyde : Not more than 4.0
- (5) Fluorescence Whitening Agent : Not detected

#### **5. Metal-Base**

##### **1) Definition**

Metal-base refers to the materials made of a metal or metal alloy. Metal cans are not subject to this standard.

##### **2) Material Specifications (%)**

- (1) Lead : Not more than 10 (not more than 5.0 for coating tin)
- (2) Antimony : Not more than 5.0

##### **3) Migration Specifications (mg/L)**

- (1) Lead : Not more than 1.0

#### **6. Metal Cans**

### 1) Definition

Metal Can is a metal container consisted of three pieces; top, body, and bottom, or two pieces; top and body integrated with bottom. In order to achieve a proper seal, materials other than metals may be used for top lid. Metal cans used for dried foods (except oily and fatty foods) are out of the scope of this standard.

### 2) Material Specifications (%)

(1) Lead : Not more than 10 (not more than 5.0 for coating tin)

(2) Antimony : Not more than 5.0

### 3) Migration Specifications (mg/L)

When the side in direct contact with the food is not coated by synthetic resin, this standard is applied only to arsenic, cadmium, and lead items.

(1) Arsenic : Not more than 0.2

(2) Cadmium : Not more than 0.1

(3) Lead : Not more than 0.4

(4) Phenol : Not more than 5.0

(5) Formaldehyde : Not more than 4.0

(6) Non-volatile residues (mg/L)

① Not more than 30 (not more than 240 if n-heptane used as the food simulant, but not more than 90 in the case that natural oil coating from inside of can contains more than 3% of zinc oxide)

② Chloroform soluble material substances: Not more than 30 (only in the case that non-volatile residues from water as the food simulant is more than 30)

(7) Vinyl chloride : Not more than 0.05 (only in the case of polyvinylchloride coating used at the food contact surface)

## 7. Wood

### 1) Definition

Woods refers to the parts other than tree root, branch and the bark of stalk, whose main materials are cellulose, lignin and hemicellulose or which is lacquered with latices of *Rhus Vernicifera*.

### 2) Migration Specifications (mg/L)

(1) Arsenic : Not more than 0.1

(2) Heavy metal : Not more than 1.0 (as lead)

(3) Sulfur dioxide : Not more than 12 mg (limited to wooden chopsticks; per one set)

- (4) Ortho-phenylphenol : Not more than 6.7 mg (limited to wooden chopsticks; per one set)
- (5) Thiabendazole : Not more than 1.7 mg (limited to wooden chopsticks; per one set)
- (6) Biphenyl : Not more than 0.8 mg (limited to wooden chopsticks; per one set)
- (7) Imazalil : Not more than 0.5 mg (limited to wooden chopsticks; per one set)

## **8. Glass, Ceramic Ware, Porcelain Enamel and Earthenware**

- 1) Specifications ( $\mu\text{g}/\text{cm}^2$ ) of apparatus and container which is below 2.5cm in depth or cannot contain liquid.
  - (1) Lead : Not more than 17.0
  - (2) Cadmium : Not more than 1.7
- 2) Specifications ( $\mu\text{g}/\text{mL}$ ) of apparatus and container of which depth is not less than 2.5cm and volume below 1.1L.
  - (1) Lead : Not more than 5.0 (not more than 1.0 for glazed pottery)
  - (2) Cadmium : Not more than 0.5
  - (3) Arsenic : Not more than 0.05 (only to glazed pottery)
- 3) Specifications ( $\mu\text{g}/\text{mL}$ ) of Apparatus and Container of which depth is not less than 2.5cm and volume is not less than 1.1L.
  - (1) Lead : Not more than 2.5 (not more than 1.0 for glazed pottery)
  - (2) Cadmium : Not more than 0.25 (not more than 0.5 for glazed pottery)
  - (3) Arsenic : Not more than 0.05 (only to glazed pottery)

## **9. Starch-Base**

- 1) Definition
 

Starch-base refers to a product prepared by treating the materials which is no less than 70% of the starch.
- 2) Material Specifications (mg/kg)
  - (1) Lead and cadmium : Not more than 100, respectively
- 3) Migration Specifications (mg/L)
  - (1) Arsenic : Not more than 0.1
  - (2) Heavy metal : Not more than 1.0 (as lead)
  - (3) Formaldehyde : Not more than 4.0
  - (4) Fluorescence Whitening Agent : No detection

(5) Potassium permanganate titration : Not more than 10 (however, non-water resistive container is excluded)