









# ANNEX I


## Overview of Other Common Plastic Materials Used in Baby Bottles and Children's Tableware



Materials	Symbol <sup>a</sup>	Uses	General Properties <sup>b</sup>	Major migrant(s) of concern	Adverse Health Effects of the concerned migrants	Relevant Regulations <sup>c</sup>
Polyethylene Terephthalate (PET)	 or 	Water bottles	Clear, good chemical resistance, barrier to gas, withstand temperature up to ~80°C	Antimony (catalyst)	Chronic, occupational exposure to antimony led to myocardial effect. <sup>1</sup> IARC (1989) classified antimony trioxide in Group 2B (possibly carcinogenic to humans). <sup>2</sup>	-(EU) No 10/2011 -21CFR 177.1630 -GB 13113-1991 -GB 9685-2008
High Density Polyethylene (HDPE)  Low Density Polyethylene (LDPE)	  	Flexible cup lids	Hard to semi-flexible, opaque, good chemical resistance, withstand temperature up to ~75°C	Octadecyl 3- (3 5-di-tert-butyl-4-hydroxyphenyl) propionate/ Irganox 1076 (antioxidant)	Chronic exposure to high doses affected liver of experimental animals. <sup>3</sup>	-(EU) No 10/2011, -21CFR177.1520, -GB 9687-1988 -GB 9685-2008

Materials	Symbol <sup>a</sup>	Uses	General Properties <sup>b</sup>	Major migrant(s) of concern	Adverse Health Effects of the concerned migrants	Relevant Regulations <sup>c</sup>
Polyvinyl Chloride (PVC)	 or 	Drinking straws	Unplasticised PVC: hard, brittle withstand temperature up to ~80°C Plasticised PVC: flexible and elastic	Vinyl chloride (monomer)	Occupational exposure to high doses is associated with significant increases in the incidence of cancer at multiple organ sites. <sup>4</sup> IARC (in prep)* classified it in Group 1 (carcinogenic to humans). <sup>2</sup>	-CAC/GL 6-1991 -(EU) No 10/2011, -GB 9681-1988 -GB 9685-2008
				DEHP (additive: plasticiser)	Chronic exposure to high doses affected liver, kidney, reproduction and development in experimental animals. <sup>5</sup> IARC (in prep) classified it in Group 2B. <sup>2</sup>	

\* In prep denotes the publication of the IARC classification is in preparation of as at 17 June 2011.

Materials	Symbol <sup>a</sup>	Uses	General Properties <sup>b</sup>	Major migrant(s) of concern	Adverse Health Effects of the concerned migrants	Relevant Regulations <sup>c</sup>
Polypropylene (PP)		Baby bottles, drinking straws, tableware, microwavable ware	Hard to semi-flexible, opaque, chemicals resistance, withstand temperature up to ~140°C	Octadecyl 3- (3 5-di-tert-butyl-4-hydroxyphenyl) propionate/ Irganox 1076 (antioxidant)	Chronic exposure to high doses affected liver in experimental animals. <sup>3</sup>	-(EU) No 10/2011, -21CFR177.1520, -GB 9688-1988 -GB 9685-2008
Polystyrene (PS)		Sippy cups	Clear, glassy, rigid, brittle, affected by fats and solvents. withstand temperature up to ~95°C	Styrene (monomer)	Toxic to central nervous system in humans through inhalation. <sup>6</sup> IARC (2002) classified it in Group 2B. <sup>2</sup>	-(EU) No 10/2011, -21CFR177.1640 -GB 9689-1988 -GB 9685-2008

Materials	Symbol <sup>a</sup>	Uses	General Properties <sup>b</sup>	Major migrant(s) of concern	Adverse Health Effects of the concerned migrants	Relevant Regulations <sup>c</sup>
Polyamide (PA)		Baby bottles	Clear, amber, hard, good chemical resistance, withstand temperature up to ~170°C	Caprolactam (monomer)	Chronic exposure to large dose caused developmental toxicity in experimental animals. <sup>7</sup> IARC (1999) classified it in Group 4 (probably not carcinogenic to humans). <sup>2</sup>	-(EU) No 10/2011, -21CFR177.1500 -GB 16332-1996 -GB 9685-2008
Polysulfone (PES, PPSU)	<b>PES, PPSU</b>	Baby bottles	Clear, amber in colour, hard, good chemical resistance, good withstand temperature up to ~200°C	4,4'-dichloro-diphenylsulphone (monomer)	Chronic exposure affected liver, kidney, and CNS in animal studies. <sup>8</sup>	-(EU) No 10/2011, -21CFR177.2440 -GB 9685-2008
				4,4'-dihydroxydiphenol sulphone/ bisphenol S (monomer)	Potent inducer of methaemoglobinemia in rats and human. <sup>9</sup>	

Materials	Symbol <sup>a</sup>	Uses	General Properties <sup>b</sup>	Major migrant(s) of concern	Adverse Health Effects of the concerned migrants	Relevant Regulations <sup>c</sup>
Polylactic acid (PLA)		Bio-degradable tableware	Opaque, hard, brittle, withstand temperature up to ~80°C	lactic acid, lactide (monomer)	Adverse effect is not expected since lactic acid is a safe food substance. <sup>10</sup>	-(EU) No 10/2011, -GB 9685-2008
Tritan Copolyester (PCTG)		Reusable water bottles	Clear, hard, good chemical resistance, withstand temperature up to ~100°C	2,2,4,4-tetramethyl-cyclobutane-1,3-diol (TMCD) (monomer)	Exposure to high doses affected adrenal gland and development in experimental animals. <sup>11</sup>	-(EU) No 10/2011, -USFDA FCN No. 1041 -GB 9685-2008
Acrylonitrile Butadiene Styrene (ABS)	<b>ABS</b>	Chopsticks and other tableware	Opaque, high impact resistance, good chemical resistance, withstand temperature up to ~80°C	Acrylonitrile	Chronic exposure of pregnant animals to acrylonitrile results in developmental toxicity, including malformations. IARC (1999) classified it in Group 2B. <sup>2</sup>	-CAC/GL 6-1991 -(EU) No 10/2011, -21CFR177.1020 -GB 17327-1998 -GB 9685-2008

Notes: <sup>a</sup> Plastic identification codes or symbols marked on the articles. <sup>b</sup> Information are based on plastic associations from different countries (i.e. Plastics New Zealand, British Plastics Federation and PlasticsEurope), and specifications of products provided by manufacturers. Properties of food contact articles made of each plastic material may vary due to differences in formula, processing methods, technologies, etc. <sup>c</sup> Refer to regulations or standards stipulated by the Codex, European Commission, USFDA, and Ministry of Health of the People's Republic of China.

## References

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