



Japan Toy Safety Standard Part 3 - Chemical Properties (ST-2012)

Toxic Analysis by Material Types

Materials	PVC, PE	Paper, Rubber toy	PVC coating	Paint coating	Textile, Adhesive	Soap bubble solution	Writing ink	PVC, PU, Rubber	Metal parts
Test items									
Clause	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.11
Color running ^{*1}	ü	ü	ü	ü	ü	ü	ü	ü	ü
Consumption of KMnO ₄	ü	-	ü	-	-	-	-	-	-
Residue after evaporation	ü	-	ü	-	-	-	-	-	-
Heavy metal (Pb)	ü	ü	-	-	-	ü	-	-	-
Arsenic	ü	ü	-	-	-	-	-	-	-
Cadmium	PVC	-	-	-	-	-	-	-	-
Heavy element ^{*2}	-	-	-	ü	-	-	ü	-	ü
Formaldehyde	-	-	-	-	ü	-	-	-	-
Phthalates	PVC	Rubber	ü	-	-	-	-	ü	-

*1. Coloring matters should be selected from Schedule 1 of the Food Sanitation Law Enforcement Regulations except those which complied with the color running test (clause 1.1).
 *2. Surface coatings include PVC coatings shall be tested for soluble content of 8 heavy elements (clause 1.5) while metal parts shall be tested for soluble lead content (clause 1.11).

PVC, PE (Clause 1.2) & Vinyl Chloride Resin Coating (Clause 1.4)

Material	Consumption of KMnO ₄ (µg/ml)	Residue on Evaporation (µg/ml)	Heavy metals (Pb) (µg/ml)	Arsenic (µg/ml)	Cd (µg/ml)
Materials mainly composed of polyvinyl chloride	≤ 50	≤ 50	≤ 1 ^{*3}	≤ 0.1 ^{*3}	≤ 0.5
Materials mainly composed of polyethylene	≤ 10	≤ 30	≤ 1 ^{*3}	≤ 0.1 ^{*3}	-
Vinyl chloride resin coating	≤ 50	≤ 50	-	-	-

Decalomania, Folded Paper & Rubber-made Toy (Clause 1.3)^{*4}

	Heavy metals (Pb)	Arsenic (Arsenious acid)
Standard value (µg/ml)	≤ 1 ^{*3}	≤ 0.1 ^{*3}

*3. Color from test solution should not be deeper than that of the comparison standard solution.
 *4. Rubber pacifier shall be tested separately according to clause 1.10.

Paint Coating and Writing Ink (Clause 1.5 & 1.8)

Heavy element	Sb	As	Ba	Cd	Cr	Pb	Hg	Se
Soluble content (mg/kg)	60	25	1000	75	60	90	60	500

Textile and Adhesive Product used for Toys (Clause 1.6)

Classification by age	Free Formaldehyde
Textile products intended for children ≤ 24 months	≤ 16 µg/g (Abs. ≤ 0.05)
Textile products intended for children > 24 months that touch human body directly during their use, and adhesives used for toy wigs, eyelashes, beards and garters	≤ 75 µg/g

Soap Bubble Solution (Clause 1.7)

Classification by products	Standard value			
	Surface active agent equivalent content ^{*6}	Volume of soap bubble solution per container	Fluorescent brightener	Heavy metal
Soap bubble produced by straw-type toy ^{*5}	≤ 3%	≤ 30ml	None	None
Soap bubble produced by non-straw-type toy	≤ 3%	≤ 600ml	None	None

*5. with the straw directly put to the mouth when soap bubbles are blown and which is so constructed as to prevent ingestion of bubble solution.
 *6. excluding soap content

Synthetic Resin mainly composed of PVC, PU or Rubber (Clause 1.9)

Classification		PVC ^{*7}	PU, Rubber
Designated toys ^{*8}	Toys that are intended for children up to 6 years of age	DEHP, DBP or BBP ≤ 0.1%	
	Toy parts that are intended to come in direct contact with the mouth	DEHP, DBP, BBP, DINP, DIDP or DNOP ≤ 0.1%	
	Parts (of mouth toy) that are NOT in direct contact with the mouth	DEHP, DBP, BBP or DINP ≤ 0.1%	DEHP, DBP or BBP ≤ 0.1%
Non-designated toys	Toy parts that are intended to come in direct contact with the mouth	DEHP or DINP ≤ 0.1%	-
	Parts (of mouth toy) that are NOT in direct contact with the mouth	DEHP ≤ 0.1%	-

*7. Pacifiers and teething rings shall not use synthetic resin containing PVC.
 *8. Designated toys are toys prescribed in Article 78(1) of the Enforcement Regulations of the Food Sanitation Law.

Rubber Pacifier (Clause 1.10)

Material test (µg/ml)		Dissolution test (µg/ml)				
Cadmium	Lead	Phenol	Formaldehyde	Zinc	Heavy metals (Pb)	Residue on evaporation
≤ 0.5	≤ 0.5	≤ 5	None ^{*3}	≤ 1	≤ 1	≤ 40

Metal Parts (Clause 1.11)

Heavy element	Lead
Soluble content (mg/kg)	≤ 90