

# TOYOTA ENGINEERING STANDARD

NO. : TSZ0001G

TITLE : CONTROL METHOD FOR SUBSTANCES OF ENVIRONMENTAL CONCERN

CLASS : C2


Established/Revised : Rev.5(Oct.2004)

This standard has been revised in consequence of the following changes:

- (1) the title of this standard has been changed.
- (2) the status of lead, cadmium, mercury and hexavalent chromium has been changed from restricted substance to prohibited substance in response to the enforcement of relevant ELV directive (EU Directive:2000/53/EC) and the establishment of Toyota's basic policy for the reduction of substances of environmental concern.
- (3) the contents have been changed in part to increase conformity with the list of substances of environmental concern issued by International Material Data System (IMDS).
- (4) a provision on substances specified for reduction has been newly established in response to the revision of relevant EU Directive (76/769/EEC).
- (5) a provision on examination method for the content of lead, cadmium, mercury and hexavalent chromium has been added.

Engineering Information  
Planning Dept.  
Engineering Administration Div.  
TOYOTA MOTOR CORPORATION



	<b>TOYOTA ENGINEERING STANDARD</b>	<b>TSZ0001G</b>	<b>CLASS</b> <b>C2</b>
<b><u>CONTROL METHOD FOR SUBSTANCES OF ENVIRONMENTAL CONCERN</u></b>			
<p><b>1. Scope</b> This standard covers the prohibition, restriction and reduction of the use of substances of environmental concern contained in all parts and materials (including indirect materials) used in vehicles and the control of usage information on such substances.</p> <p><b>2. Terms and Definitions</b></p> <p><b>2.1 Substance of Environmental Concern</b> (1) A substance suspected of causing detrimental effects on environmental conservation or human health (2) In this standard, any substances that are determined to be applicable, if incorporated in vehicles, to (1) during use or disposal of the vehicles are shown in Tables 1 through 5.</p> <p><b>2.2 Substance Code</b> A code allocated to a substance of environmental concern for identification. Substance codes in this standard comply with CAS numbers, which are allocated by the Chemical Abstract Service (CAS) of the American Chemical Society and are used widely around the world. There are some substances or substance groups of unknown CAS numbers. For such substances, Toyota numbers (T#### or M####) are allocated.</p> <p><b>3. Substance Prohibition and Restriction</b> (1) The substances of environmental concern shown in Tables 1 and 4 shall be prohibited from use in vehicles. Use of lead, mercury, cadmium and hexavalent chromium shall be allowed however insofar as the use and time limit restrictions shown in Attached Table 2 are met. (2) The substances of environmental concern shown in Table 2 shall be prohibited from use in vehicles depending on the destination or use of the vehicles.</p> <p><b>4. Substance of Environmental Concern Specified for Reduction</b> The use of substances of environmental concern shown in Table 5 shall be reduced or abandoned when so approved at a SOC meeting.</p> <p><b>5. Rule for Substances of Environmental Concern Subject to Usage Information Control (Substances of Environmental Concern shown in Tables 3 and 5)</b> If any of substances of environmental concern applicable to Section 5.1 are used, information shown in Section 5.3 shall be controlled in units shown in Section 5.2.</p>			
Prepared and Written by: ..... Quality Audit Dept. ..... Material Engineering Div.1		Engineering Administration Div. © TOYOTA MOTOR CORPORATION Established/ 5 Revised: Oct. 2004	

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard

- The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard
- This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole nor in part to any third party without prior written consent of Toyota Motor Corporation.



## TOYOTA ENGINEERING STANDARD

TSZ0001G

## 5.1 Substance of Environmental Concern Subject to Control

- (1) Substances of environmental concern mixed intentionally for adding functions
- (2) Unintentionally mixed substances of environmental concern whose inclusion is unavoidable during a reasonable production process, and whose content exceeds the threshold value shown in Table 3 or 5

<Examples of unintentionally mixed substances of environmental concern>

- (a) Impurities contained in raw materials (including recycled materials)
  - (b) Residual materials, solvents, etc. in products
  - (c) Reaction products generated during or after production processes
- Note that the threshold values have been determined on the basis of the content of substances of environmental concern in their "virtually homogenous material units."

- (3) For example, the "virtually homogenous material unit" of a printed wiring board containing lead is not the board itself but solder, PZT, lead glass and other components.

<Example of virtually homogenous material units>

- (a) Surface-treated steel sheet: steel and coating that is formed through surface treatment
- (b) Composite material: composite material as a whole (Individual components such as binding material, fiber reinforcement and filler are not considered as virtually homogenous material units.)

## 5.2 Control Units

- (1) Use part numbers of parts delivered to Toyota as control units.  
Usage information on substances of environmental concern shall be controlled by delivery part numbers, covering all component parts (excluding Toyota-supplied parts) and indirect materials (adhesives, sealers, identification paints, etc.).
- (2) Toyota-supplied parts are allocated control units separately.

## 5.3 Controlled Information

- (1) Information related to parts
  - (a) Part number
  - (b) Part name
  - (c) Part mass
- (2) Information related to containing section
  - (a) Containing section: "virtually homogenous material unit" that contains substances of environmental concern (See Section 5.1.)  
Surface treatment specification numbers shall be controlled if containing sections are treated surfaces. (Surface Treatment Specification Numbers)
    - (i) Numbers specified by Toyota Standards (TS) (Example: TSH6524G-BC)
    - (ii) Official specification number, such as ISO, if not specified by TS
  - (b) Mass of containing section: mass of containing portion per part
- (3) Information related to substances of environmental concern
  - (a) Substance codes: substance codes (CAS Nos. or Toyota Nos.) specified in Table 3 (controlled substances) and Table 5 (substances specified for reduction)

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 \* The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard.  
 \* This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
Oct. 2004

	<b>TOYOTA ENGINEERING STANDARD</b>	<b>TSZ0001G</b>
---	------------------------------------	-----------------

(b) Substance mass: mass of substance of environmental concern per "containing section per part"

(c) Purpose of usage: the purpose of using a substance of environmental concern

Table 1 Prohibited Substance

No.	Substance name	CAS/Toyota No.	Exempt use	Applicable law
1	Asbestos	1332-21-4	No exemption	Air Pollution Control Law
2	Dioxines of Furanes	Various		Dioxines Special Measures Law
3	Ozone depleting substances	See Table 4		Ozone Layer Protection Law
4	PCB: porichlorinated biphenyls	Various		Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances
5	PCT: polychlorinated terphenyl			76/769/EEC
6	Sodium azide	26628-22-8		Poisonous and Deleterious Substances Control Law
7	Lead or its compounds	Various	See Attached Table 2 <sup>1)</sup>	2000/53/EC
8	Cadmium or its compounds			
9	Mercury or its compounds			
10	Hexavalent chromium			

Note: (1)

If there is any difficulty in complying with the restriction, develop countermeasures upon consultation with the departments in charge of designing and legal matters (Quality Audit Dept., Material Engineering Div. 1).

6. Inclusion Examination of Substances of Environmental Concern (Lead, Cadmium, Mercury, Hexavalent Chromium)

Examine the content of substances of environmental concern (lead, cadmium, mercury and hexavalent chromium) in accordance with TS20003G.

Table 2 Restricted Substances (With Destination, Use Restrictions)

No.	Substance name	CAS/Toyota No.	Use restriction (applicable law)
11	Triethanolamine	102-71-6	Use in coolant for Norway is prohibited (Norway Bestilling snr. 463)
12	Methanol	67-56-1	Use prohibited for Nordic countries (SFS 1985:840)
13	2,4,6-tri-tert-butylphenol	732-26-3	Use prohibited for Japan (Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances)
14	Distannoxane, hexabutyl-	56-35-9	
15	1,4-Benzendiamine, N,N'-bis(methylphenyl)-	27417-40-9	
16	1,4-Benzendiamine, N,N'-bis(dimethylphenyl)-	28726-30-9	
17	1,4-Benzendiamine, N-methylphenyl-N'-dimethylphenyl-	70290-05-0	
18	Polychlorinated Naphthalenes	Various	

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 \*The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the expiration of current version of this standard.  
 \*This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
Oct. 2004

**TOYOTA ENGINEERING STANDARD TSZ0001G**

Table 3 Controlled Substances

No.	Substance name	CAS/Toyota No.	Example of use	Threshold value <sup>(2)</sup>	Applicable law <sup>(1)</sup>
7	Lead or its compounds	M0001	Uses shown in Attached Table 2	0.1 mass%	9
8	Cadmium or its compounds	M0002		0.01 mass%	
9	Mercury or its compounds	M0003		0.1 mass%	
10	Hexavalent Chromium	M0004	Uses other than those restricted in Table 2		
11	Trichloroamine	102-71-6			
12	Methanol	67-56-1			
13	2,4,6-tri-tert-butylphenol	732-26-3			
14	Distannoxane, hexabutyl-	56-35-9			
15	1,4-Benzendiamine, N,N'-bis(methylphenyl)-	27417-40-9			
16	1,4-Benzendiamine, N,N'-bis(dimethylphenyl)-	28726-30-9			
17	1,4-Benzendiamine, N-methylphenyl-N'-dimethylphenyl-	70290-05-0			
18	Polychlorinated Naphthalenes	M0005			
19	1-Chloro-2,3-epoxy-propane	106-89-8			
20	Acetaldehyde	75-07-0	Volatile component in plastic, etc.		
21	Acetamide	60-35-5	Softener	3	
22	Acrylamide	79-06-1	Polyacrylamide plastic monomer		
23	Acrylonitrile	107-13-1	Monomer of ABS plastic		
24	Alkylphenol ethoxylates:	M0019	Surfactant (windshield washer fluid)	1	
25	Aniline and its salts	M0020	Pigment		
26	Antimony or its compounds	M0006	Flame retarder (aid), solid lubricant	---	
27	Antimonytrioxide (Diantimonytrioxide)	1309-64-4	Flame retarder, solid lubricant	1	
28	Aromatic amines or their salts:	M0021	Impurities in color for natural materials	0.01 mass%	1,4,5
29	Arsenic or its compounds	M0007	Semiconductor, glass, pigment		
30	Barium compounds (organic or water soluble) except Ba-carboxylate.	M0022	Pigment, stabilizer	1 mass%	1
31	Benzene	71-43-2	Fuel, raw material solvent	0.01 mass%	4,5
32	Beryllium or its compounds	M0008	Electrical contact	0.1 mass%	1
33	Biocidal coatings and additives	M0023	Biocidal agent		7
34	Brominated flame retardants:	M0012	Flame retarder for plastic, etc.		4,8
35	Butadiene (1,3-Butadiene)	106-99-0	Dien rubber, ABS plastic	1	
36	Carbonylsulfide	75-15-0	Evaporates from vulcanized rubber		
37	Ceramic Fibers (Mineral, Natural or Synthetic)	M0015	Friction lining, insulation		

Note: (2)  
Standard for implementing control. The threshold values for metallic compounds have been determined on the basis of the mass of individual metallic elements.

Note: (3)  
Refer to Attached Table 3, which shows the major examples of applicable laws.

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard:  
 \* The recipient shall discard by shredding or fry, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned at the revision of current version of this standard.  
 \* This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
Oct. 2004

**TOYOTA ENGINEERING STANDARD TSZ0001G**

Table 3 (Continued)

No.	Substance name	CAS/Toyota No.	Example of use	Threshold value <sup>(2)</sup>	Applicable law <sup>(1)</sup>
38	Chlorinated hydrocarbons:	M0024	Cleaner, solvent for mildewproofing agent and insecticide	0.1 mass%	1
39	Chloroaniline	106-47-8	Plastic crosslinker		4
40	Chloroparaffines, unbranched (C <sub>10</sub> -H <sub>22n</sub> C <sub>0</sub> , to C <sub>10</sub> -H <sub>12</sub> C <sub>0</sub> ; n = 1-28)	M0013	Flame retarder		1
41	Cobalt or its compounds (excluding cobalt in steels)	M0009	Zinc-cobalt electroplating, alloy		---
42	Colophony (Rosin)	8050-09-7	Solder		---
43	Copper, metallic	7440-50-8	---		1
44	Diamino-diphenyl-methane (4,4'-Diaminodiphenylmethane)	101-77-9	By-product of plastic, adhesive, etc.		---
45	Dichloropropanols (1,3-Dichloro-2-propanols)	96-23-1	Solvent for flame retarder, etc.		1.5
46	Ethyl-/Methyl-Glycols or their Acetates:	M0014	Solvent for wax, color		---
47	Formaldehyde	50-00-0	Adhesive, degraded plastic		---
48	Chlorobromomethane (Halon 1011)	74-97-5	Digestive agent	---	
49	Hexachlorocyclohexane	58-89-9	Insecticide, antiseptic for wood	0.1 mass%	7
50	Hexamethylenetetramine	100-97-0	Curing, blowing agent		---
51	2-Ethylhexylamine	104-75-6	Color, surfactant, synthetic material		1
52	Di-(2-ethylhexyl)amine	106-20-7	Unreacted substance of plastic, pigment, etc.		12
53	Hydrazine	302-01-2	Refrigerant		---
54	Ethane, 1,1,1-trichloro-2-fluoro-	2366-36-1	Evaporates from rubber curing agent		---
55	Ethane, 1-chloro-1,2-difluoro-	338-64-7			---
56	Ethane, monochlorodifluoro-	338-65-8			---
57	Ethane, 1,2-difluoro-1,1,2-trichloro-	354-15-4			---
58	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	358-25-6			---
59	Ethane, 1,1,2-trichloro-1-fluoro-	811-95-0		---	
60	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-	138495-42-8		---	
61	Butane, 1,1,1,2,2,3,3,4,4-nonfluoro-4-methoxy-	163702-07-6		---	
62	Ethane, pentafluoro-	354-13-6		---	
63	Difluoromethane	75-10-5		---	
64	1,1-Difluoroethane	75-37-6	---		
65	Vinylidene fluoride	75-38-7	---		
66	Trifluoromethane	75-46-7	---		
67	1,1,1,2-Tetrafluoroethane	811-97-2	---		
68	Hydrogen Sulphide	7783-06-4	Unreacted substance, by-product of plastic	1	
69	Methylacrylamidomethoxy-acetate	77402-03-0			

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 \* The recipient shall obtain by shredding or by return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of present version of this standard.  
 \* This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole nor in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct. 2004

**TOYOTA ENGINEERING STANDARD TSZ0001G**

Table 3 (Continued)

No.	Substance name	CAS/Toyota No.	Example of use	Threshold value <sup>(1)</sup>	Applicable law <sup>(2)</sup>
70	Nonomethyldibromodiphenylmethane	99688-47-8	Unreacted substance, by-product of insulation fluid, plastic	0.1 mass%	4
71	Nonomethyldichlorodiphenylmethane	81161-70-8			
72	Nonomethyltetrachlorodiphenylmethane	76253-60-6			
73	N,N-Dimethylformamide	68-12-2	Solvent for raw material	---	14,15
74	Nickel or its compounds	M0010	Welding, plating, special metal		4
75	Nitrites	M0025	Additive for coolant, cutting oil, curing agent for special rubber		1
76	Nitroso amines	M0026	Produced when nitrous acid reacts with amine under acidic condition	0.1 mass%	4,5
77	Organotin compounds (excluding Diorganotins and Triorganotins)	M0016	Stabilizer for plastic		
78	Pentachlorophenol (PCP) or its salts	M0027	Antiseptic		
79	Perfluoroalkyl compounds: includes PFOS	M0028	Water repellent, etc.	0.1 mass%	---
80	Phenol	108-95-2	Unreacted substance, degradation product of plastic		
81	Phenylenediamines or its salts	M0029	Color, materials for synthetic rubber		
82	Phthalates (excluding DBP and DOP)	M0017	Plasticizer	Benz(a)pyrene: 1 ppm Others: 10 ppm	1
83	Polycyclic aromatic hydrocarbons (PAH)	M0030	Mineral oil, carbon black		
84	Polybrominated Terphenyls (PBT)	M0031	Flame retarder		0.1 mass%
85	Nitrocellulose	9004-70-0	Initiating agent	---	18
86	Ammonium Perchlorate	7790-98-9			
87	Radioactive substances (including scrap metal)	70795	Discharge lamp		
88	Styrene (Vinyl benzene) monomer	100-42-5	Unreacted substance of plastic	---	1
89	Styrene oxide (Epoxy styrene)	96-09-3			
90	Sulfur Hexafluoride	2551-62-4	Tire filling gas, insulation gas	---	1
91	Thallium or its compounds	M0012	Electronic parts		
92	Thioperoxydicarbonic diamide, ((H2N)C(S)2)2, tetramethyl-	137-26-8	Biocidal agent, additive for rubber		
93	Tri(2-chloroethyl)phosphate	115-96-8	Flame retarder	---	1
94	Trichlorophenol or its salts	M0033	Biocidal agent, antiseptic for cloth, leather		
95	Trichloropropane (1,2,3-Trichloropropane)	96-18-4	Crosslinker, solvent	---	4
96	Trimethylphosphate	512-56-1	Flame retarder		
97	Triphenylphosphate	115-86-6			

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 - The recipient shall disclose by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the completion of the work concerned or the revision of current version of this standard.  
 - This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct.2004



## TOYOTA ENGINEERING STANDARD

TSZ0001G

Table 3 (Continued)

No.	Substance name	CAS/Toyota No.	Example of use	Threshold value <sup>(1)</sup>	Applicable law <sup>(2)</sup>	
98	1,3-Butadiene, 2-chloro-, homopolymer	9010-98-4	None	0.1 mass%	---	
99	Ethene, homopolymer, chlorinated, chlorosulfonated	68037-39-8				
100	2,3-epoxypropan-1-ol	556-52-5				
101	4,4'-di-o-toluidine	119-93-7	Pigment, curing agent	0.1 mass%	---	
102	Toluene-2,4-Diamine	95-80-7	Antioxidant for rubber			
103	Di(2-ethylhexyl)adipate	103-23-1	Plasticizer			
104	4,4'-Methylenebis-(2-chlorobenzeneamine)	101-14-4	Curing agent for urethane rubber			
105	Tris-(1-aziridinyl)phosphine oxide	545-55-1	Flame retarder			16
106	Tris(2,3-dibromopropyl)phosphate (TRIS)	126-72-7				17
107	Vinyl chloride monomer	75-01-4	Unreacted substance of PVC			5 ppm

NOTES: The recipients of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 (1) The recipient shall safeguard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the expiration of statutory retention of this standard.  
 (2) This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct. 2004





Table 4 Banned Ozone Depleting Substances

Substance name of environmental concern	CAS	Substance name of environmental concern	CAS
CFC 11 (Trichlorofluoromethane)	75-69-4	CFC 213a (1,1,1-Dichloro-1,1,2,2,2-pentafluoroethane)	17882-79-1
CFC 12 (Dichlorodifluoromethane)	75-71-8	CFC 213b (1,1-Dichloro-1,1,2,2,2-pentafluoroethane)	11552-56-2
CFC 113 (1,1,2-Trichloro-1,1,2,2-tetrafluoroethane)	74-11-1	CFC 224 (Chlorotrifluoroethane)	827-37-1
CFC 113a (1,1,1-Trichlorotrifluoroethane)	554-58-3	CFC 225 (Pentachlorofluoroethane)	421-98-3
CFC 114 (1,1,2-Dichloro-1,1,2,2-tetrafluoroethane)	374-87-2	CFC 233 (Tetrachlorodifluoroethane)	468-09-9
CFC 114a (1,2-Dichloro-1,1,2,2-tetrafluoroethane)	16-16-2	CFC 233 (Trichlorotrifluoroethane)	421-98-8
CFC 115 (Chloropentafluoroethane)	74-12-1	CFC 234 (Dichlorotetrafluoroethane)	427-00-4
Molon 1211 (Bifluorochlorobromomethane)	153-59-5	CFC 235 (Chloropentafluoroethane)	427-07-8
Molon 1202 (Trifluorobromomethane)	75-63-8	CFC 241 (Tetrachlorodifluoroethane)	468-27-3
Molon 2102 (1,1-Dibromo-1,1,2,2-tetrafluoroethane)	124-73-2	CFC 242 (Trichlorodifluoroethane)	1119-53-6
CFC 11 (Chlorotrifluoroethane)	75-72-9	CFC 241 (Dichlorotrifluoroethane)	7125-99-7
CFC 111 (Pentachlorofluoroethane)	334-74-3	CFC 249 (Chlorotetrafluoroethane)	427-13-0
CFC 112 (2,2,1,1,2-Tetrachlorodifluoroethane)	78-51-9	CFC 251 (Tetrafluoroethane)	818-79-3
CFC 114 (1,1,1,2,2-Tetrachloro-1,1,2-difluoroethane)	76-12-0	CFC 252 (Dichlorodifluoroethane)	7126-15-0
CFC 112 (Tetrachlorodifluoroethane)	26403-34-3	CFC 253 (Chlorotrifluoroethane)	427-47-6
CFC 211 (Heptachlorofluoroethane)	—	CFC 257b (1-Chloro-1,1,1-trifluoroethane)	640-15-5
CFC 212 (Hexachlorodifluoroethane)	461-95-1	CFC 281 (Dichlorofluoroethane)	428-81-1
CFC 222 (Pentachlorotrifluoroethane)	153-59-7	CFC 267 (Chlorodifluoroethane)	428-99-5
CFC 214 (1,1,2,2-Tetrachloro-2,2,2,2-tetrafluoroethane)	2368-15-4	CFC 271 (Chlorofluoroethane)	428-01-0
CFC 215 (1,1,2-Trichloro-1,2,2,2,2-pentafluoroethane)	1452-61-9	Dibromodifluoroethane	15-62-1
CFC 255 (Trichloropentafluoroethane)	—	Dibromodifluoroethane	460-23-3
CFC 216 (1,1-Dichloro-1,1,2,2,2,2-hexafluoroethane)	443-97-2	Tetrafluoroethane	—
CFC 217 (Chlorohexafluoroethane)	423-84-6	Dibromotrifluoroethane	24292-63-1
Carbon tetrachloride	56-23-9	Dibromofluoroethane	358-91-8
1,1,1-Trichloroethane	71-55-6	Dibromodifluoroethane	51504-16-8
CFC 21 (Dichlorofluoroethane)	75-43-4	Dibromochloroethane	1064-73-7
CFC 22 (Chlorodifluoroethane)	75-45-6	Dibromopentafluoroethane	421-78-2
CFC 21 (Chlorofluoroethane)	505-10-2	Tetrafluoroethane	—
CFC 121 (1,1,1,2-Tetrachloro-1-fluoroethane)	334-44-3	Tetrafluoroethane	—
CFC 121 (Tetrachlorofluoroethane)	—	Tetrafluoroethane	106-40-9
CFC 121a (1,1,1,2-Tetrachloro-2-fluoroethane)	554-31-0	Tribromodifluoroethane	—
CFC 122 (Trichlorodifluoroethane)	754-31-2	Tribromodifluoroethane	78191-80-3
CFC 123 (1,2-Dichloro-1,1,1-trifluoroethane)	106-83-2	Tribromotrifluoroethane	—
CFC 124 (1-Chloro-1,1,2-tetrafluoroethane)	2057-89-0	Tribromotrifluoroethane	—
CFC 121 (Trichlorodifluoroethane)	259-78-2	Tribromofluoroethane	—
CFC 121 (Dichlorodifluoroethane)	421-86-1	Bromodifluoroethane	—
CFC 122b (1,2-Dichloro-1,1-difluoroethane)	1449-68-7	Bromodifluoroethane	—
CFC 123 (1-Chloro-1,2,2-trifluoroethane)	421-87-2	Bromodifluoroethane	1511-62-2
CFC 123a (1-Chloro-1,1,1-trifluoroethane)	73-88-7	Bromotetrafluoroethane	324-72-1
CFC 311 (1,2-Dichloro-2-fluoroethane)	420-37-9	Bromotrifluoroethane	479-04-5
CFC 124 (1,1-Dichloro-2-fluoroethane)	1117-50-6	Bromotrifluoroethane	421-46-5
CFC 142 (Chlorodifluoroethane (CFC-142))	23491-26-4	Bromofluoroethane	242-48-1
CFC 142b (1,1,1-Chlorodifluoroethane)	75-69-1	Bromofluoroethane	352-31-6
CFC 151 (Chlorofluoroethane)	1433-73-4	Bromofluoroethane	373-31-4
CFC 223 (Tetrachlorofluoroethane)	412-46-2	Bromobisfluoroethane	2732-79-1
CFC 223 (Pentachlorodifluoroethane)	412-49-1	Bromopentafluoroethane	460-82-8
CFC 227 (Tetrachlorotrifluoroethane)	411-81-2	Pentabromodifluoroethane	—
CFC 228 (Trichlorotrifluoroethane)	422-34-6	Pentabromofluoroethane	—
CFC 229 (Dichloropentafluoroethane)	—	Dibromotrifluoroethane	—
CFC 233a (2,2-Dichloro-1,1,1,2,2-pentafluoroethane)	128903-21-9	Tribromofluoroethane	75172-14-4
CFC 233b (2,2-Dichloro-1,1,1,2,2-pentafluoroethane)	427-41-0	Hexafluoroethane	—
CFC 233c (1,2-Dichloro-1,1,2,2,2-pentafluoroethane)	427-44-4	Molon 2102 (dibromotrifluoroethane)	554-94-1
CFC 233d (2,2-Dichloro-1,1,1,2,2-pentafluoroethane)	421-56-4	1-bromo-1,1,1-trifluoroethane	421-66-7
CFC 233e (1,2-Dichloro-1,1,1,2,2-pentafluoroethane)	507-55-1	Bromotrifluoroethane	—
CFC 233f (1,1-Dichloro-1,2,2,2,2-pentafluoroethane)	13474-84-9	Methyl bromide	74-81-9
CFC 233g (1,2-Dichloro-1,1,1,2,2-pentafluoroethane)	431-84-7		

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 1. The recipient shall discard or destroy, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard.  
 2. This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole nor in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct.2004

	<b>TOYOTA ENGINEERING STANDARD</b>	<b>TSZ0001G</b>
---	------------------------------------	-----------------

**Table 5 Substances Specified for Reduction**

No.	Substance name	CAS/Toyota No.	Example of use (applicable law)
108	Polybrominated Biphenyls	M0011	Flame retarder for plastic (76/769/EEC)
109	Polybrominated Diphenylethers (excluding Decabrominated Diphenylether)	T0217	
110	Dibutyl phthalate	84-74-2	PVC, rubber additive (76/769/EEC)
111	Diethyl phthalate (Di 2-ethylhexyl phthalate)	117-81-7	
112	Azocolourants (or Azodyes)	T0608	Color for leather, cloth (76/769/EEC)
113	Poly vinyl chloride	M0034	Cable sheath, electrical tape

**Note: (4)**  
 Azo pigment that liberates 30 ppm or more amine compounds shown in Attached Table 4.

**Applicable Standard**

**TSZ0003G Test Method for Analyzing Content of Substances of Environmental Concern in Automotive Materials and Parts**

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 • The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard.  
 • This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole nor in part to any third party without prior written consent of Toyota Motor Corporation.

**Established/ 5 Revised:  
 Oct. 2004**



## TOYOTA ENGINEERING STANDARD

TSZ0001G

Attached Table 1 Atomic Weights (Excerpt)

Atomic symbols in alphabetic order

Atomic symbol	Atomic number	Chemical element	Atomic weight	Atomic symbol	Atomic number	Chemical element	Atomic weight
Ag	47	Silver	107.86	Mo	42	Molybdenum	95.94
Al	13	Aluminum	26.98	N	7	Nitrogen	14.01
As	33	Arsenic	74.92	Na	11	Sodium	22.99
Au	79	Gold	196.97	Nb	41	Niobium	92.91
B	5	Boron	10.81	Ni	28	Nickel	58.69
Ba	56	Barium	137.33	O	8	Oxygen	16.00
Be	4	Beryllium	9.01	Os	76	Osmium	190.20
Bi	83	Bismuth	208.98	P	15	Phosphorus	30.97
Br	35	Bromine	79.90	Pb	82	Lead	207.20
C	6	Carbon	12.01	Pd	46	Palladium	106.42
Ca	20	Calcium	40.08	Pt	78	Platinum	195.08
Cd	48	Cadmium	112.41	Rb	37	Rubidium	85.47
Cl	17	Chlorine	35.45	Re	75	Rhenium	186.21
Co	27	Cobalt	58.93	Rh	45	Rhodium	102.91
Cr	24	Chrome	52.00	Ru	44	Ruthenium	101.07
Cs	55	Cesium	132.91	S	16	Sulfur	32.07
Cu	29	Copper	63.55	Sb	51	Antimony	121.76
F	9	Fluorine	19.00	Sc	21	Scandium	44.96
Fe	26	Iron	55.85	Se	34	Selenium	78.96
Ga	31	Gallium	69.72	Si	14	Silicon	28.09
Ge	32	Germanium	72.61	Sn	50	Tin	118.71
H	1	Hydrogen	1.01	Sr	38	Strontium	87.62
Hg	80	Mercury	200.59	Ta	73	Tantalum	180.95
I	53	Iodine	126.90	Tc	52	Tellurium	127.60
In	49	Indium	114.42	Ti	22	Titanium	47.88
Ir	77	Iridium	192.22	Tl	81	Thallium	204.38
K	19	Potassium	39.10	V	23	Vanadium	50.94
Kr	36	Krypton	83.80	W	74	Tungsten	183.85
Li	3	Lithium	6.94	Y	39	Yttrium	88.91
Mg	12	Magnesium	24.31	Zn	30	Zinc	65.39
Mn	25	Manganese	54.96	Zr	40	Zirconium	91.22

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 1) The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the obsolescence of current version of this standard.  
 2) This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct.2004

**TOYOTA ENGINEERING STANDARD TSZ0001G**

Attached Table 2 Exempt Use and Prohibition Enforcement Date<sup>(1)</sup>

Prohibited substance	Material	Intended purpose of use	Example of uses		Enforcement date
Lead	Metallic lead	Used as weights taking advantage of its high specific gravity	Wheel balance weight		July, 2004 for continuous production vehicles
			Vibration damper		To be determined
	Alloying element	Added to improve machinability	Steel (lead $\leq 0.35$ mass%)	Free-cutting aluminum (lead $\leq 2$ mass%)	July, 2004
			Free-cutting aluminum (lead $\leq 1$ mass%)		July, 2007
			Copper alloy (lead $\leq 4$ mass%)	Valve sheet	To be determined
			Bearing, bush made of lead bronze		To be determined
	Organic materials	Added as thermal stabilizer, acid acceptor, light stabilizer, etc. in form of lead compound	Rubber	O ring	July, 2004
			Protective coating	Fuel hose, PS hose	August, 2004
			Electrodeposition coating		
	Glass/ceramic	Added to improve lubricity in form of lead compound	Friction material	Copper for brake pad (lead $\leq 0.5$ mass%)	July, 2003 (July, 2004 for continuous production vehicles)
	Glass/ceramic	Added to lower melting point in form of lead compound	Glass	Electric bulb	March, 2004
			Insulator	Plug	
	Electric/electronic materials	Component of solder (for lowering melting point and improving wettability)	Solder	---	To be determined
			Glass-ceramic	PZT (supersonic motor, buzzer, filter)	
Added in form of lead compound for melting point and resistance adjustment			MLC resistant element, protector, PTC, capacitor		
		Motor (carbon brush)		March, 2004 for continuous production vehicles	
Material for electrode		Battery		To be determined	
Initiating agent	Component of initiating agent	Air bag		July, 2006	
Cadmium	Electric/electronic materials	Added for melting point and resistance adjustment	Thick film paste	MLC resistant element, protector	July, 2005

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.  
 \*The recipient shall disclose by the selling or buying, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard.  
 \*This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct.2004

	<b>TOYOTA ENGINEERING STANDARD</b>	<b>TSZ0001G</b>
---	------------------------------------	-----------------

Attached Table 2 (Continued)

Prohibited substance	Material	Intended purpose of use	Example of uses	Enforcement date
Mercury	Electric-discharge tube	Component of tiller gas	HID head lamp	To be determined
			Display	
			Motor backlight	
			Passenger compartment fluorescent lamp	
Hexavalent chromium	Anti-corrosive treatment	Major compound of anti-corrosive coating and pigment	Electro-galvanized steel plate	July, 2006
			Electro-galvanizing (bluish silver/yellow)	
			Electro-galvanizing (green/black)	
			Tin-zinc alloy plating	
			Zinc-iron alloy plating	
			Zinc-nickel alloy plating	
			Aluminum chromate conversion coating	
			Zinc chromate conversion coating	
			Chromate conversion coating for ZNY	
			Dacrodized process	
			Chrome rinse for ED pre-treatment	

**Note: (5)**

When mixed unintentionally, 0.01 mass% or less cadmium per material and 0.1 mass% or less lead, mercury and hexavalent chromium per material are excluded from the prohibition. For aluminum and brake lining copper, however, lead content not exceeding 0.4 mass% is excluded from the prohibition. If any revision is made to the exempt uses (ANNEX II: 2002/525/EC) set forth in the EU ELV Directive (2000/53/EC), the exempt uses specified herein shall be revised in accordance with the newest version of the Directive. In such case, the prohibition enforcement date shall be 12 months earlier than the date stipulated by the Directive.

NOTES: The recipients of this standard shall undertake the following confidentiality obligations upon the receipt of this document:  
 \*The recipient shall discard by shredding or fire, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the revision of current version of this standard.  
 \*This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct. 2004



TOYOTA ENGINEERING STANDARD

TSZ0001G

Attached Table 3 Applicable Law

No.	Law
1	EU-D 67/548/EEC
2	Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances
3	EU-D 2003/53/EC
4	EU-D 76/769/EEC
5	ChemVerbots V
6	TRGS 614, 905
7	GefStoffV incl. Annex IV Nr.5
8	EU-D 2003/11/EEC
9	EU-D 2000/53/EEC
10	EU-R 594/91/EEC
11	Norway Bestillingsnr.463
12	EC Regulation 2037/2000
13	SFS 1985:840; SFS 1986:8
14	1999/137/EC
15	91/689/EEC
16	EU-D 83/264/EEC
17	EU-D 79/663/EEC
18	Strahlenschutzverordnung (StrSchV)

NOTES: The recipients of this standard shall undertake the following confidentiality obligations upon the receipt of this standard:  
 a) The recipient shall discard by shredding or fry, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the provision of current version of this standard.  
 b) This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole nor in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
 Oct.2004



Attached Table 4 Restricted Amine Compound

No.	Substance name	CAS No.
1	biphenyl-4-ylamine, 4-aminobiphenyl, xenyamine	92-67-1
2	benzidine	92-87-5
3	4-chloro-o-toluidine	95-69-2
4	2-naphthylamine	91-59-8
5	o-aminoazotoluene, 4-amino-2',3-dimethylazobenzene, 4-o-tolylazo-o-toluidine	97-56-3
6	5-nitro-o-toluidine	99-55-8
7	4-chloroaniline	106-47-8
8	4-methoxy-m-phenylenediamine	615-05-4
9	4,4'-methylenedianiline, 4,4'-diaminodiphenylmethane	101-77-9
10	3,3'-dichlorobenzidine, 3,3'-dichlorobiphenyl-4,4'-ylenedia-mine	91-94-1
11	3,3'-dimethoxybenzidine, o-dianisidine	119-90-4
12	3,3'-dimethylbenzidine, 4,4'-bi-o-toluidine	119-93-7
13	4,4'-methylenedi-o-toluidine	838-88-0
14	6-methoxy-m-toluidino, p-cresidine	120-71-8
15	4,4'-methylene-bis-(2-chloro-aniline), 2,2'-dichloro-4,4'-methylene-diani-line	101-14-4
16	4,4'-oxydianiline	101-80-4
17	4,4'-thiodianiline	139-65-1
18	o-toluidine, 2-aminotoluene	95-53-4
19	4-methyl-m-phenylenediamine	95-80-7
20	2,4,5-trimethylaniline	137-17-7
21	o-anisidine, 2-methoxyaniline	90-04-0
22	4-amino azobenzene	60-09-3

NOTES: The recipient of this standard shall undertake the following confidentiality obligations upon the receipt of this standard.

The recipient shall discard, by shredding or file, or return to Toyota Motor Corporation if appropriate, the documents contained in this standard when they are no longer necessary due to the termination of the work concerned or the expiration of current version of this standard.

This standard and the technical information related thereto are owned by and under sole control of Toyota Motor Corporation. They shall not be disclosed in whole or in part to any third party without prior written consent of Toyota Motor Corporation.

Established/ 5 Revised:  
Oct.2004

