

## General Specification on Chemical Substances Ver. 24.0

### 1. Objective

NTT Innovative Devices Corporation has established the "General Specifications on Chemical Substances" to clearly specify the requirements and to ensure the control of chemical substances specifications contained in products or used in process concerning the products delivered to us.

### 2. Application

The general specification shall apply for our procurement of materials\*1).

\*1) "Materials" hereunder shall correctly mean parts/ raw materials/ half-finished products/ units/ apparatuses /cables/ display material (ink, labels, etc.) that are incorporated in OUR products and packaging materials directly-contacting with them (trays, plastic bags, etc.), and packaging materials used for shipping of OUR products (boxes, trays, tapes, cushions, etc.).

### 3. Requirements

#### 3-1. Specified control of chemicals and materials

No.	Requirements	Contents
(1)	Not to use Banned substances in process	# "Banned substances" (used in process) means the substances prohibited for use in process, assembling, mounting, fabricating, processing or forming. (Defined in Separate Table 1 of Annex)
(2)	Not to contain Banned substances	# "Banned substances" (contained) means the substances which should not be contained in parts, materials and packaging materials. (Defined in Separate Table 2 of Annex) * If it is contained, purchase is not implemented. *If you note that delivered products contain banned substances, you should inform to us with documents as soon as possible.
		\$ In the case of the content less than the limit level, if you know its value, please disclose the content information. *If you note mistakes in the content information, you should inform to us with documents as soon as possible.
(3)	To properly manage the controlled substances	# The substance should be controlled, and the information about the amount of content should be known. (Defined in Separate Table 3 of Annex) *Please disclose the content information. *If you note mistakes in the content information, you should inform to us with documents as soon as possible.

#: Essential requirement/\$: Essential requirement if applicable

#### 3-2. Change management

If there are important changes concerning the material, parts and process, please inform us with documents about the details of the changes concerning the above Section 3-1.

#### 4. Submission of documents

We require suppliers to submit the below documents\*2).

No.	Documents	Substances
(a)	“Non-containing Certification of Banned Substances” (Form 1-1)	“Banned substances”
(b)	“Chemical Substances Survey Sheet” (Form 2-1), or “chemSHERPA*3)”	“Banned substances” “Controlled substances”
(c)	“SVHC Survey Sheet” (Form 2-2)	“Controlled substances” (“SVHC”)
(d)	List of Total Constructional Elements. (Form 3)	

\*2) We may require other survey forms to comply with our customer request.

\*3) Please submit the latest version of “chemSHERPA” downloaded at the following URL:

<https://chemsherpa.net/chemSHERPA/english/>

#### 5. Operation of the General Specification

-In case of applying this General Specification, this information will be stated in Individual procurement specification (or purchase order).

-When this General Specification and Individual-procurement-specification conflict with each other, the latter prevails.

-In case of noticing mistakes such as contents about the submitted reports to us on 4 (a) - (d), you should correct the reports and re-submit them to us.

#### 6. Special instructions

Even if we ask you in advance whether you can comply with our requirements about the “General Specification”, there is no commitment from us to place an order to you.

## General Standard Chemical Substances Management Ver. 24.0 ANNEX

**Table 1 Banned substances in production processes**

The following substances are banned from being used in production process of the products. These correspond to the ozone depleting substances in IEC 62474 database.

No.	Substances Group	Substances
0-1	Ozone-depleting substances defined by Montreal Protocol	Chlorofluorocarbons (CFCs)
		1,1,1-Trichloroethane
		Carbon tetrachloride
		Halons
		HBFCs
		Methyl bromide
		Bromochloromethane
		HCFCs

**Table 2 Banned substances**

The following substances are banned from being contained in and/or being added to the products that delivered to us. If they are unintentionally contained beyond threshold levels, purchase is not implemented. This category includes some materials in IEC 62474 database and/or banned substances specified by NTT (Nippon Telegraph and Telephone Corporation).

No.	IEC/ NTT*1)	Substances	Threshold levels (Remarks)
1-1	IEC	Cadmium/Cadmium compounds	Threshold levels and exempted applications are indicated in Tables 2a and 2b, respectively. (Substances banned by RoHS directive)
1-2	IEC	Hexavalent chromium	
1-3	IEC	Lead/Lead compounds	
1-4	IEC, N	Mercury/Mercury compounds	
1-5	IEC, N	Polybrominated biphenyls (PBBs)	
1-6	IEC, N	Polybrominated diphenylethers (PBDEs)	
1-7	IEC	Bis(2-ethylhexyl) phthalate (DEHP) (CAS No. 117-81-7)	
1-8	IEC	Benzyl butyl phthalate (BBP) (CAS No. 85-68-7)	
1-9	IEC	Dibutyl phthalate (DBP) (CAS No. 84-74-2)	
1-10	IEC	Diisobutyl phthalate (DIBP) (CAS No. 84-69-5)	
1-11	IEC, N	Bis(Tributyl tin) oxide (TBTO) (CAS No. 56-35-9)	Intentionally added, or 1000 ppm
1-12	IEC	Tri-substituted organostannic compounds (TBT and TPT, etc.)	Intentionally added, or 1000 ppm
1-13	IEC	Dibutyltin (DBT) compounds	1000 ppm
1-14	IEC	Diocetyl tin (DOT) compounds	
1-15	IEC, N	Polychlorinated biphenyls (PCBs) and specific substitutes (Ugilec141, Ugilec121, Ugilec21, DBBT)	Intentionally added
1-16	IEC	Polychlorinated terphenyls (PCTs)	50 ppm
1-17	IEC, N	Polychlorination naphthalenes (PCNs) (1 or more [ The number of chlorine ] )	Intentionally added
1-18	IEC, N	Short-chain chlorinated paraffins (carbon chain length 10-13)	Intentionally added, or 1000 ppm
1-19	IEC, N	Asbestos (Amosite, Crocidolite, Chrysotile, Actinolite, Anthophyllite, and Tremolite)	Intentionally added
1-20	IEC	Azo compounds that produces specific amines (Table 2c) by decomposition	30 ppm
1-21	IEC, N	Ozone-depleting substances (CFCs, 1,1,1-Trichloroethane, Carbon tetrachloride, Halons, HBFCs, Methyl bromide, Bromochloromethane, HCFCs)	Intentionally added
1-22	IEC	Radioactive substances	Intentionally added
1-23	IEC, N	2-(2H-1,2,3-benzotriazol-2-yl)-4,6-di-tert-butylphenol(CAS No. 3846-71-7)	Intentionally added, or 1000 ppm

1-24	IEC, N	Perfluorooctane sulfonate (PFOS/PFOSF) (C <sub>8</sub> F <sub>17</sub> SO <sub>2</sub> X; X=OH, O-M <sup>+</sup> , halide, amide, and other derivatives including polymers)	Intentionally added, or 1000 ppm
1-25	IEC	Perfluorooctanoic acid (PFOA) and its salts, and PFOA-related substances	0.025 ppm The total concentration of PFOA-related substances: 1 ppm
1-26	IEC	Dimethyl fumarate (CAS No. 624-49-7)	0.1 ppm
1-27	IEC, N	Hexabromocyclododecane (HBCDD)	Intentionally added, or 1000 ppm
1-28	IEC	Phenol, isopropylated phosphate (PIP (3:1)) (CAS No. 68937-41-7)	Intentionally added
1-29	IEC	Perfluorocarboxylic acids with 9 to 14 carbon atoms (C <sub>9</sub> -C <sub>14</sub> PFCAs) and their salts, and C <sub>9</sub> -C <sub>14</sub> PFCA-related substances	0.025 ppm The total concentration of C <sub>9</sub> -C <sub>14</sub> PFCA-related substances: 0.26ppm
1-30		Red phosphorus (use in resin only)	Intentionally added
1-31	N	Hexachlorobenzene (HCB)	Intentionally added (Banned substances specified by NTT)
1-32	N	Aldrin	
1-33	N	Dieldrin	
1-34	N	Endrin	
1-35	N	DDT	
1-36	N	Chlordanes (Heptachlor)	
1-37	N	N,N-Ditolyl-p-phenylenediamine, N-Tolyl-N-xylyl -p-phenylenediamine, and N,N-Dixylyl -p-phenylenediamine	
1-38	N	2,4,6-Tri Tertiary Butyl Phenol	
1-39	N	Toxaphene	
1-40	N	Mylex	
1-41	N	Yellow-phosphorus match	
1-42	N	Benzidines	
1-43	N	4-Aminodiphenyls	
1-44	N	4-Nitrodiphenyls	
1-45	N	Bis(chloromethyl)ether	
1-46	N	Beta-naphthylamines	
1-47	N	Rubber adhesive containing benzene beyond 5wt%	
1-48	N	Cyanogen compounds	
1-49	N	Organophosphorous compounds (Parathion, Methyl-parathion, Methyl-demeton, and EPN)	
1-50	N	Polychlorinated dibenzofuran (PCDF)	
1-51	N	Polychlorinated dibenzo-p-dioxin (PCDD)	
1-52	N	Coplanar PCB (Co-PCB)	
1-53	N	Kelthane or Dicofol	
1-54	N	Hexachlorobuta-1,3-diene	
1-55	N	Pentachlorobenzene	
1-56	N	Alfa-hexachlorocyclohexane	
1-57	N	Beta-hexachlorocyclohexane	
1-58	N	Gamma-hexachlorocyclohexane/Lindane	
1-59	N	Chlordecone	
1-60	N	Endosulfan	
1-61	N	Pentachlorophenol, and individual salts and esters	

\*1) IEC: Specific substances in IEC 62474 database, N: Banned substances specified by NTT.

**Table 2a Substances banned by RoHS directive and threshold levels\*2)**

Substance name	Threshold level	
Cadmium/Cadmium compounds	100 ppm	The sum of the concentrations of 4 substances in packaging materials: 100 ppm
Hexavalent chromium	1000 ppm	
Lead/Lead compounds	1000 ppm	
	300 ppm (for vinyl chloride cables)	
Mercury/Mercury compounds	1000 ppm	
Polybrominated biphenyls (PBBs)	1000 ppm	
Polybrominated diphenylethers (PBDEs)	1000 ppm	
Bis(2-ethylhexyl) phthalate (DEHP)	1000 ppm	
Benzyl butyl phthalate (BBP)	1000 ppm	
Dibutyl phthalate (DBP)	1000 ppm	
Diisobutyl phthalate (DIBP)	1000 ppm	

\*2) Concentration should be calculated based on the mass of each part uniformly containing above substances.

**Table 2b Exempted applications from RoHS directive**

Substance name	Exemption code	Exempted application
Cadmium/ Cadmium compounds	Cd-8(b)-I	Cadmium and its compounds in electrical contacts used in: (Expires on the date decided by EU) - circuit breakers, - thermal sensing controls, - thermal motor protectors (excluding hermetic thermal motor protectors), - AC switches rated at: - 6 A and more at 250 V AC and more, or - 12 A and more at 125 V AC and more, - DC switches rated at 20 A and more at 18 V DC and more, and - switches for use at voltage supply frequency $\geq 200$ Hz.
	Cd-13(b)-(II)	Cadmium in striking optical filter glass types. (Expires on the date decided by EU)
	Cd-13(b)-(III)	Cadmium in glazes used for reflectance standards. (Expires on the date decided by EU)
Lead/Lead compounds	Pb-5(b)	Lead in glass of fluorescent tubes not exceeding 0.2 % by weight. (Expires on the date decided by EU)
	Pb-6(a)-I	Lead as an alloying element in steel for machining purposes containing up to 0.35 % lead by weight and in batch hot dip galvanised steel components containing up to 0.2 % lead by weight. (Expires on the date decided by EU)
	Pb-6(b)-II	Lead as an alloying element in aluminum for machining purposes with a lead content up to 0.4 % by weight. (Expires on the date decided by EU)
	Pb-6(c)	Copper alloy containing up to 4 % lead by weight. (Expires on the date decided by EU)
	Pb-7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead). (Expires on the date decided by EU)
	Pb-7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound. (Expires on the date decided by EU)
	Pb-7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or

		250 V DC or higher. (Expires on the date decided by EU)
	Pb-13(a)	Lead in white glasses used for optical applications. (Expires on the date decided by EU)
	Pb-13(b)-(I)	Lead in ion coloured optical filter glass types. (Expires on the date decided by EU)
	Pb-13(b)-(III)	Lead in glazes used for reflectance standards. (Expires on the date decided by EU)
	Pb-15(a)	Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies: (Expires on the date decided by EU) - a semiconductor technology node of 90 nm or larger; - a single die of 300 mm <sup>2</sup> or larger in any semiconductor technology node; - stacked die packages with die of 300 mm <sup>2</sup> or larger, or silicon interposers of 300 mm <sup>2</sup> or larger.
	Pb-18(b)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi <sub>2</sub> O <sub>5</sub> :Pb). (Expires on the date decided by EU)
	Pb-24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors. (Expires on the date decided by EU)
	Pb-29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC. (Expires on the date decided by EU)
	Pb-32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes. (Expires on the date decided by EU)
	Pb-34	Lead in cermet-based trimmer potentiometer elements. (Expires on the date decided by EU)
Mercury/ Mercury compounds	Hg-1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner): (f)-I For lamps designed to emit mainly light in the ultraviolet spectrum: 5 mg. (Expires on 24 February 2027) (f)-II For special purposes: 5 mg. (Expires on 24 February 2025)
	Hg-2(b)	Mercury in other fluorescent lamps not exceeding (per lamp): (3) Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9): 10 mg. (Expires on 24 February 2025) (4)-I Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg. (Expires on 24 February 2025) (4)-II Lamps emitting mainly light in the ultraviolet spectrum: 15 mg. (Expires on 24 February 2027) (4)-III Emergency lamps: 15 mg. (Expires on 24 February 2027)
	Hg-3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes used in EEE placed on the market before 24 February 2022 not exceeding (per lamp): (Expires on 24 February 2025) (a) Short length ( $\leq 500$ mm): 3.5 mg. (b) Medium length (> 500 mm and $\leq 1500$ mm): 5 mg. (c) Long length (>1500 mm): 13 mg.
	Hg-4(a)-I	Mercury in low pressure non-phosphor coated discharge lamps, where the application requires the main range of the lamp- spectral output to be in the ultraviolet spectrum: up to 15 mg mercury may be used per lamp. (Expires on 24 February 2027)
	Hg-4(b)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 80$ : $P \leq 105$ W: 16 mg may be used per burner. (Expires on 24 February 2027)

	Hg-4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): (Expires on 24 February 2027) (I) $P \leq 155$ W: 20 mg. (II) $155$ W < $P \leq 405$ W: 25 mg. (III) $P > 405$ W: 25 mg.
	Hg-4(e)	Mercury in metal halide lamps (MH). (Expires on 24 February 2027)
	Hg-4(f)	(I) Mercury in other discharge lamps for special purposes not specifically mentioned in the Annex of 2011/65/EU. (Expires on 24 February 2025) (II) Mercury in high pressure mercury vapour lamps used in projectors where an output $\geq 2000$ lumen ANSI is required. (Expires on 24 February 2027) (III) Mercury in high pressure sodium vapour lamps used for horticulture lighting. (Expires on 24 February 2027) (IV) Mercury in lamps emitting light in the ultraviolet spectrum. (Expires on 24 February 2027)

**Table 2c Specific amines**

Substance Chemical	CAS No.	Chemical Formula
Biphenyl-4-ylamine	92-67-1	C <sub>12</sub> H <sub>11</sub> N
Benzidine	92-87-5	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub>
4-chloro-o-toluidine	95-69-2	C <sub>7</sub> H <sub>8</sub> ClN
2-naphthylamine	91-59-8	C <sub>10</sub> H <sub>9</sub> N
o-aminoazotoluene	97-56-3	C <sub>14</sub> H <sub>15</sub> N <sub>3</sub>
5-nitro-o-toluidine	99-55-8	C <sub>7</sub> H <sub>8</sub> N <sub>2</sub> O <sub>2</sub>
4-chloroaniline	106-47-8	C <sub>6</sub> H <sub>6</sub> ClN
4-methoxy-m-phenylenediamine	615-05-4	C <sub>7</sub> H <sub>10</sub> N <sub>2</sub> O
4,4'-methylenedianiline	101-77-9	C <sub>13</sub> H <sub>14</sub> N <sub>2</sub>
3,3'-dichlorobenzidine	91-94-1	C <sub>12</sub> H <sub>10</sub> Cl <sub>2</sub> N <sub>2</sub>
3,3'-dimethoxybenzidine	119-90-4	C <sub>14</sub> H <sub>16</sub> N <sub>2</sub> O <sub>2</sub>
3,3'-dimethylbenzidine	119-93-7	C <sub>14</sub> H <sub>16</sub> N <sub>2</sub>
4,4'-methylenedi-o-toluidine	838-88-0	C <sub>15</sub> H <sub>18</sub> N <sub>2</sub>
6-methoxy-m-toluidine	120-71-8	C <sub>8</sub> H <sub>11</sub> NO
4,4'-methylene-bis(2-chloroaniline)	101-14-4	C <sub>13</sub> H <sub>12</sub> Cl <sub>2</sub> N <sub>2</sub>
4,4'-oxydianiline	101-80-4	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> O
4,4'-thiodianiline	139-65-1	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> S
o-toluidine	95-53-4	C <sub>7</sub> H <sub>9</sub> N
4-methyl-m-phenylenediamine	95-80-7	C <sub>7</sub> H <sub>10</sub> N <sub>2</sub>
2,4,5-trimethylaniline	137-17-7	C <sub>9</sub> H <sub>13</sub> N
o-anisidine	90-04-0	C <sub>7</sub> H <sub>9</sub> NO
4-aminoazobenzene	60-09-3	C <sub>12</sub> H <sub>11</sub> N <sub>3</sub>

**Table 3 Controlled substances**

Substances with control mean that the content of the substances in the products should be confirmed and controlled appropriately. “Contained” means situations in which the substances are intentionally added to, blended with, or adheres to any parts of the supplies, or in which they are unintentionally contained beyond the threshold levels. This category corresponds to IEC 62474 database materials other than banned substances shown in Table 2 and substances of very high concern (SVHC) in REACH regulation. The concentration should be calculated for each part of products.

No.	IEC*3)	Substances	Threshold levels (Remarks)
2-1	IEC	Beryllium Oxide (BeO) (CAS No. 1304-56-9)	1000 ppm
2-2	IEC	Nickel (external application only)	Intentionally added
2-3		Polyvinyl Chloride (PVC) and PVC copolymers	1000 ppm
2-4	IEC	Brominated flame retardants (except PBB, PBDE, and HBCDD)	1000 ppm
2-5	IEC	Chlorinated flame retardants	1000 ppm
2-6	IEC	Perchlorates	0.006 ppm
2-7	IEC	Fluorinated greenhouse gases (PFC, SF <sub>6</sub> , HFC)	Intentionally added
2-8	IEC	Formaldehyde (CAS No. 50-00-0)	Intentionally added
2-9	IEC	Diisononyl phthalate (DINP) (CAS No. 28553-12-0, CAS No. 68515-48-0)	Intentionally added, or 1000 ppm
2-10	IEC	Diisononyl phthalate (DIDP) (CAS No. 26761-40-0, CAS No. 68515-49-1)	Intentionally added, or 1000 ppm
2-11	IEC	Di-n-octyl phthalate (DNOP) (CAS No. 117-84-0)	Intentionally added, or 1000 ppm
2-12	IEC	Di-n-hexyl phthalate (DnHP) (CAS No. 84-75-3)	Intentionally added, or 1000 ppm
2-13	IEC	Polycyclic-aromatic hydrocarbons (PAH) Benzo[a]pyrene (CAS No. 50-32-8) Benzo[e]pyrene (CAS No. 192-97-2) Benzo[a]anthracene (CAS No. 56-55-3) Chrysen (CAS No. 218-01-9) Benzo[b]fluoranthene (CAS No. 205-99-2) Benzo[j]fluoranthene (CAS No. 205-82-3) Benzo[k]fluoranthene (CAS No. 207-08-9) Dibenzo[a,h]anthracene (CAS No. 53-70-3)	1 ppm
2-14	IEC	4,4'-isopropylidenediphenol (CAS No. 80-05-7)	Intentionally added, or 1000 ppm
2-15		Pentachlorothiophenol (CAS No. 133-49-3)	1 %
2-16		Antimony/Antimony compounds	1000 ppm
2-17		Arsenic/Arsenic compounds	1000 ppm
2-18		Other Beryllium/Beryllium compounds	1000 ppm
2-19		Selenium/Selenium compounds	1000 ppm
2-20 To be cont.		SVHC in REACH regulation*4)	1000 ppm

\*3) IEC: Specific substances in IEC 62474 database.

\*4) When the European Chemical Agency (ECHA) has added some substances to the candidate list of Substances of Very High Concern (SVHC), the substances are included in the list of “Controlled substances”.