



QUALITY SPECIFICATION

ENVIRONMENTAL CONSERVATION PROGRAM

PN: 526-000223-01 Rev U

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1 Purpose

- 1.1 With regards to the “Environment-related Substances to be Controlled (‘Controlled Substances’)” contained in the parts and devices employed in Synaptics products, this Specification clarifies (1) banned substances, (2) substances to be phased out, and (3) exempted substances and their uses, in order to realize the following aims and objectives:
 - 1.1.1 To prevent the above-mentioned substances from being used in Synaptics products;
 - 1.1.2 To comply with related laws and regulations;
 - 1.1.3 To reduce the influence of the above substances upon the ecosystem;
and
 - 1.1.4 To contribute to the preservation of the global environment.
- 1.2 This standard will be updated and correspond with regulations, laws and customer requirements immediately when amendments issue.

2 Scope

This Environmental Specification applies to the following parts/devices constituting Synaptics designed products manufactured by Synaptics Contract Manufacturing partners and components and material procured from third parties listed on Synaptics Approved Manufacturers List:

- i) Electrical parts;
- ii) Mechanical parts;
- iii) Semiconductor devices;
- iv) Printed circuit boards (PCBs);
- v) Packaging materials/packaging parts (e.g. trays, bags, cushions, staples, sheets, wraps, tapes, labels, corrugated cardboard, wooden frames, vinyl ties, and inks or paints for printing);
- vi) The materials employed in subsidiary parts and materials (e.g. adhesives, adhesive tapes, labels, glob top, epoxy and soldering materials) used for Synaptics products.

Disclaimer: The lists of substances contained thereafter are extensive but illustrative; Synaptics does not represent them as exhaustive. In the event of a conflict between the requirements contained herein and local, national and international environmental laws, in all cases, the environmental laws shall take precedence even though the substances or their purposes are not clearly regulated in this Environmental Specification.

3 Reference documents

- 3.1 REGULATION (EC) No 1907/2006, and its amendments.
- 3.2 Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive (RoHS) 2011/65/EU, and its amendments.
- 3.3 Packaging and Packaging Waste Directive 94/62/EC and its amendments.
- 3.4 Montreal Protocol (on Substances that Deplete the Ozone Layer) and the amendments.
- 3.5 Synaptics Declaration of Nonuse Form, 534-000438-01.
- 3.6 Synaptics Material Data Form (MDF), 534-000237-01.
- 3.7 Quality System Policy, Supplier Management Program, 578-000442-01
- 3.8 Quality System Policy, Control of Quality Records, 578-000438-01
- 3.9 Procedure, Product Change Notification, 578-000229-01
- 3.10 XRF Inspection Requirement, 526-000487-01

4 Terms and Definitions

In this Specification, terms are defined as follows:

- 4.1 Environmental-related Substances to be Controlled ('Controlled Substances') are those which, according to Synaptics judgment, have significant environmental-impact on both humans and the global environment among the substances contained in parts and devices.
- 4.2 Management standards
 - 4.2.1 Level 1 – The substances and their applications classified into this Level are banned for the use in parts and materials;
 - 4.2.2 Level 2 – On the date set in each table, the substances and their applications in the respective tables shall be reclassified into Level 1;
 - 4.2.3 Level 3 – No effective date of the ban on the delivery is currently set for the substances and their applications classified into this Level. The ones under Level 3 shall be reclassified into Level 2 for banning the use of them in phases, depending on the availability of alternative parts or materials that satisfy the intended uses;
 - 4.2.4 Exemption - The substances and their application classified as Exemption are those not regulated by or exempted from laws, or excepted from the 'Controlled Substances' because of the unavailability of adequate alternative parts and materials that satisfy the intended uses.

- 4.3 “Contained” is a situation in which a substance is added to, fills up, mingles with, or adheres to (i) the parts or devices employed in products, or (ii) the materials used for the parts or devices, regardless if the situation is intentionally created or not. (When a substance is unintentionally contained in, or added to a product in a processing process, this is also regarded as “Contained.”) There are substances called Dopants (Doping Agents) that are intentionally added to manufacture semiconductor devices, etc. They are not treated as “Contained” if present in the devices in a very small amount.
- 4.4 An “Impurity” is a substance that satisfies either or both of the following conditions:
- 4.4.1 A substance contained in a natural material which cannot technically be totally removed in a refining process (i.e. natural purities); and/or
- 4.4.2 A substance generated in a synthesis process, the total removal of which is technically impossible.
- Note 1: Additionally, there are substances called “impurities,” the name of which is used to distinguish them from main materials. If they are used for the purpose of changing the characteristics of a material, they are treated as “Contained.”
- Note 2: The ‘Controlled Substances’, which mingles with or adhere to parts or devices as an “Impurity”, must not exceed its allowable concentration specified in this Specification.
- 4.5 Effective date of the ban on the delivery indicates the date on or after which Synaptics will not accept the parts and/or materials specified in the corresponding column of Table 5.2.
- 4.6 Plastics refer to materials and raw materials composed of synthetic high-molecular polymers in this Specification. More specifically, “plastics” mainly mean the following articles composed of synthetic high-molecular polymers: resins, films, adhesives, adhesive tapes, molded products, products made of synthetic rubber, and plastics made from raw materials of plant origin. When a natural resin is synthesized with any one of the above articles, the synthetic substance is a plastic.
- 4.7 “Homogeneous” material is a material cannot be “mechanically disjointed” into different materials. The term ‘homogeneous’ is understood as “of uniform composition throughout”, so examples of “homogeneous materials” would be individual types of plastics, ceramics, glass, metals, alloys, paper, board, resins and coatings. The term ‘mechanically disjointed’ means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes.
- 4.8 Definitions of Organic and Inorganic materials:
- 1) Organic materials: It is a general term of organic compounds which are chemical compounds whose molecules contain carbon. It covers plastics (including PI, PET, PP, PE...), rubber, ink, paint, resin, epoxy, adhesive, Mylar, PCB materials (including laminate, prepreg, solder mask, marking ink, carbon ink...) and FPC materials (including FCCL, coverlay, PI stiffener, Bonding sheet, EMI tape...).

2) Inorganic materials: It is a general term of inorganic compounds which are chemical compounds except organic compounds. It covers metal, metal alloys, metal plating, ceramic, glass, solder, silicon wafer...

5 Management Standards for the Environment-Related Controlled Substances

5.1 “Environment-related Substances to be Controlled (‘Controlled Substances’)”

The table below lists the “Environment-related Substances to be Controlled (‘Controlled Substances’)” defined in this Specification.

Table 5.1. List of “Environment-related Substances to be Controlled (‘Controlled Substances’)”

Substances	
Heavy Metals	Cadmium and cadmium compounds
	Lead and lead compounds
	Mercury and mercury compounds
	Hexavalent chromium its compounds
Chlorinated organic compounds	Polychlorinated biphenyls
	Polychlorinated naphthalenes (PCN)
	Polychlorinated terphenyls (PCT)
	Chlorinated paraffins (CP)
	Mirex (Perchlordecone)
	Other chlorinated organic compounds
Brominated organic compounds	Polybrominated biphenyls (PBBs)
	Polybrominated diphenyl ethers (PBDEs) (including Decabromodiphenyl ether [DecaBDE])
	Tetrabromobisphenol-A-bis(2,3-dibromopropylether) (TBBP-A-bis)
	Hexabromocyclododecane (HBCDD)
	Other brominated organic compounds
Antimony	
Tributyltin compounds (TBT); Triphenyltin compounds (TPT); Tricyclohexyltin (TCyT) compounds; Tri-n-octyltin (TOT) compounds.	
Dibutyltin (DBT) compounds	
Diocyltin (DOT) compounds	
Asbestos	
Specific azo compounds	
Formaldehyde	
Polyvinyl chloride (PVC) and PVC blends	
Beryllium; Beryllium oxide; Beryllium copper	

Specific phthalates (DEHP, DBP, BBP, DINP, DIDP, DNOP, DNHP, DIBP, Bis(2-methoxyethyl)phthalate, 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich and 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters, 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear, DIPP, N-pentyl-isopentylphthalate, DPP)
Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)
Ozone depletion substances (ODS)
Radioactive materials
Brominated dioxins/furans and Chlorinated dioxins/furans
Ethylene Glycol Monomethyl Ether, Ethylene Glycol Monoethyl Ether and its acetate
Arsenic
Halogenated aromatic substances
Halogenated diphenyl methanes
Perfluorooctane sulfonates (PFOS)
Specific benzotriazole
Surfactants (DTDMAC, DODMAC/DSDMAC and DHTDMAC)
Perfluorooctyl acid and individual salts and esters of PFOA
Bisphenol A
Pentachlorophenol (PCP)
Triclosan
Cobalt dichloride
Dimethyl fumarate (DMF)
Hexachlorobenzene
Aldrin
Dieldrin
Endrin
DDT
Chlordanes
N,N-ditolyl-p-phenylenediamine, N-tolyl-N-xyl-p-phenylenediamine and N,N-dixyl-p-phenylenedimine
2,4,6-tri-tert-butylphenol
Toxaphene
Mirex
Kelthane
Hexachlorobutadiene
2(2H-benzotriazol-2-yl)-4,6-di-tert-butylphenol
Red phosphorous (mutch)
Benzidine and its salts
4-Aminobiphenyl and its salt
4-Nitrobiphenyl and its salts

Bis(chloromethyl)ether
β-Naphthylamine and its salts
Rubber cement containing benzene (over 5%)
Polycyclic Aromatic Hydrocarbons (PAHs)
Methylenediphenyl diisocyanate (MDI)
Nitrogen trifluoride
Pentachlorobenzene
Tris (2-carboxyethyl) phosphine (TCEP)
Diarsenic trioxide, Diarsenic pentaoxide
Boric acid, specific sodium borates
4-(1,1,3,3-tetramethylbutyl) phenol
Bis(2-methoxyethyl) ether
N, N-dimethylacetamide (DMAC)
Ethylene glycol dimethyl ether (EGDME)
Perchlorates
Toluene
Benzene
Phosphine
Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene (BNST)
n-Hexane
Antimicrobial and/or Biocidal Substances
Diphenylamine, Substituted (SDPA)
Ethanol, 2-[(2-aminoethyl)amino]
Chlorine bleaching agent/Chlorinate Organic Solvents
Chlorobenzene
1,2,4 Trichlorobenzene
2-(2-methoxyethoxy)ethanol (DEGME)
2-(2-butoxyethoxy)ethanol (DEGBE)

Table 5.2. Main “Targets” and “Effective date of the ban on the delivery” regarding ‘Controlled Substances’

Substances: Cadmium and cadmium compounds		
All metals, alloys, inorganic compounds, organic compounds, inorganic salt, organic salt, and other substances that contain cadmium		
Targets	Control limits	Effective date of the ban on the delivery

Level 1	<ul style="list-style-type: none"> - The stabilizers, pigments, or dyes used for plastics (including rubber) materials (e.g. labels, cabinets, phonograph records, cable tie, the keys of remote commanders, the outer plastic resins of electrical parts, and the insulators of electrical wiring) - Paints , inks, plastics (including synthetic rubber) 	- 5 ppm in homogenous materials	Banned
	<ul style="list-style-type: none"> - Surface treatment (e.g. electroplating, electroless plating, etc.) and coating - Photographic films - Fluorescent lamps (small-sized one, straight-tube ones) 	<ul style="list-style-type: none"> - 5 ppm for organic homogenous materials; - 50 ppm for inorganic homogenous materials 	
	<p>All uses except those specified in Exemption</p> <p>Typical examples are given below:</p> <ul style="list-style-type: none"> - Switches, relays, breakers, DC motor, and other electrical contact points - Fuse elements of temperature fuses - Glass, and the pigments as well as dyes of glass paints (paints for glass, and the pigments as well as dyes used for glass) 	<ul style="list-style-type: none"> - 5 ppm for organic homogenous materials; - 50 ppm for inorganic homogenous materials 	
	- Solder	- 20 ppm in Solder	
	- CdS-photocells and the phosphors	- 50 ppm in	

	contained in fluorescent display devices - Resistor elements (glass frit)	homogenous materials	
	- Parts composed of metals containing zinc (e.g. brass, hot dip galvanizing, etc.) whose cadmium concentration is more than 100 ppm	- 50 ppm in homogenous materials	
	- Optical glass	- 50 ppm in homogenous materials	
Exemption	- Plating of electrical contacts, for which high reliability is required and which has no alternative materials - Filter glass		N/A

Standards for measurement: IEC62321-5:2013, ICP-AES

Substances: Lead and lead compounds			
All metals, alloys, inorganic compounds, organic compounds, inorganic salt, organic salt, and other substances that contain lead			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	<ul style="list-style-type: none"> - The paints, and inks containing lead, which are used for PCBs - Surface costing (plating) for the external electrodes, lead wires, and other areas of parts (e.g. electrical parts, semiconductor devices, and heat sinks) - The stabilizers, pigments, or dyes contained in the plastics (including rubber) materials that are used for outer and exposed area of the following articles: mice, devices, AC adaptors, connection cords, remote commanders, and power supply cords - The paints and inks used for outer and exposed area of devices 	<ul style="list-style-type: none"> - 90 ppm in homogenous materials 	Banned
	<p>All uses except those specified in Exemption</p> <p>Typical examples are given below:</p> <ul style="list-style-type: none"> - Leaded solder that meets both of the following conditions: 1) lead content is less than 85 wt%; and 2) lead content is more than 1000ppm - All kinds of alloys (including solder materials) whose individual lead concentration exceed their allowable ones provided in the table at bottom of Exemption below. (*1) - The stabilizers, pigments, and dyes contained in the plastic (including rubber) materials that are used for areas (excluding outer and exposed ones) of the following articles: mice, devices, AC adaptors, connection cords, remote commanders, and power supply cords - The paints and inks used for areas 	<ul style="list-style-type: none"> - 100 ppm for organic homogenous materials; - 700 ppm for inorganic homogenous materials 	

	<p>other than the outer and exposed ones of devices</p> <ul style="list-style-type: none"> - Electroless plating films such as electroless nickel plating and electroless gold plating - Glass for all uses except those specified in Exemption - Dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC 											
<p>Exemption</p>	<ul style="list-style-type: none"> - High melting temperature type solder (i.e. lead based alloys containing 85 wt% or more) - Optical glass, filter glass - Glass of cathode ray tubes - Glass of fluorescent tubes whose lead content, in proportion to their weight is 0.2% or less - Glass, glass matrix compound, ceramic or ceramic matrix compound, which is used in electrical and electronic components(e.g. piezoelectronic devices) <p>(Note: dielectric ceramic in capacitors is excluded.)</p> <ul style="list-style-type: none"> - Solder to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages - Crystal glass as defined in Annex 1 (Categories 1,2,3 and 4) of EU Directive 69/493/EEC <p style="text-align: center;">(*1) Allowable lead concentrations</p> <table border="1" data-bbox="415 1528 1172 1875"> <thead> <tr> <th>Type of alloy</th> <th>Allowable lead concentration</th> </tr> </thead> <tbody> <tr> <td>Steel</td> <td>Up to 0.35 wt%</td> </tr> <tr> <td>Aluminum alloy</td> <td>Up to 0.4 wt%</td> </tr> <tr> <td>Copper alloys (including brass and phosphor bronze)</td> <td>Up to 4 wt%</td> </tr> <tr> <td>Solder</td> <td>Up to 500 ppm</td> </tr> </tbody> </table>	Type of alloy	Allowable lead concentration	Steel	Up to 0.35 wt%	Aluminum alloy	Up to 0.4 wt%	Copper alloys (including brass and phosphor bronze)	Up to 4 wt%	Solder	Up to 500 ppm	<p>N/A</p>
Type of alloy	Allowable lead concentration											
Steel	Up to 0.35 wt%											
Aluminum alloy	Up to 0.4 wt%											
Copper alloys (including brass and phosphor bronze)	Up to 4 wt%											
Solder	Up to 500 ppm											

Standards for measurement: IEC62321-5:2013, ICP-AES

Substances: Mercury and mercury compounds			
All metals, alloys, inorganic compounds, organic compounds, inorganic salt, organic salt, and other substances that contain mercury			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	<ul style="list-style-type: none"> - Paints, inks - Hour meters - The relays, switches, or sensors whose contacts contain mercury - Mercury or its compounds mixed in plastics - All uses except those specified in Level 2 and Exemption 	- Intentionally added	Banned
	<ul style="list-style-type: none"> - Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL): Short length (not over 500mm) 	<ul style="list-style-type: none"> - Intentionally added - 3.5 mg of mercury per lamp 	
Exemption	<ul style="list-style-type: none"> - Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL): Short length (not over 500 mm): Less than 3.5 mg per lamp Medium Length (over 500 mm and not over 1500 mm): Less than 5 mg per lamp Long length (over 1500 mm): Less than 13 mg per lamp - Mercury in high-pressure gas discharge lamps (e.g. projector lamps) 		N/A
Standards for measurement: IEC62321-4:2013, ICP-AES			

Substances: Hexavalent chromium compounds			
All metals, alloys, inorganic compounds, organic compounds, inorganic salt, organic salt, and other substances that contain hexavalent chromium			
Targets		Control limits	Effective date of the ban on the

			delivery
Level 1	- Constituents of parts or materials (e.g. inks, paints, additives, etc.)	- Intentionally added	Banned
	- Residues in the surface of screws, steel sheets, etc. that are processed with plating or conversion	- Negative	
	- Metallic applications	- Negative	
Standards for measurement: IEC62321-7-1:2015 or IEC62321-7-2:2017, UV-VIS			

Substances: Polychlorinated biphenyls, Polychlorinated naphthalenes (PCN) and Polychlorinated terphenyls (PCT)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. capacitors, lubricants, insulating oils, transformers containing oil, paints, and flame retardants in plastics)	- Intentionally added	Banned
Suggested Testing method: Use GC/MS for measurement			

Substances: Chlorinated paraffins (Including Short-chain Chlorinated paraffins (SCCP) and Medium-chain Chlorinated paraffins (MCCP))			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- The cabinets of products (including accessories) and PCBs - All uses other than the above	- Intentionally added	Banned
Suggested Testing method: Use GC/MS for measurement			

Substance: Mirex (Perchlordecone)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purposes (e.g. ones for the pesticides, fungicides, and flame retardants used for resin, rubber, paints, paper, textiles, and	- Intentionally added	Banned

	electrical appliances		
Suggested Testing method: Use GC/MS for measurement			

Substances: Other chlorinated organic compounds			
Targets			Effective date of the ban on the delivery
Level 3	- The plasticizers or flame retardants contained in plastics, and the flame retardants used for PCBs		N/A
Suggested Testing method: Use GC/MS for measurement			

Substances: Polybrominated biphenyls (PBB)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. flame retardants contained in plastics)	- Intentionally added	Banned immediately
Standards for measurement: IEC62321-6:2015, GC/MS			

Substances: Polybrominated diphenyl ethers (PBDEs) (including Decabromodiphenyl ether [DecaBDE])			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. flame retardants contained in plastics) - The parts manufactured using the molding dies, which were made in or before December 2002 (Applicable only to the bodies of the displays and TV sets shipped to countries and regions other than European ones). The parts whose molding dies have been made since January 2003 must not contain PBDE.	- Intentionally added	Banned
Standards for measurement: IEC62321-6:2015, GC/MS			

Substances: Tetrabromobisphenol-A-bis(2,3-dibromopropylether) (TBBP-A-bis)			
Targets		Control limits	Effective date of the ban on the

			delivery
Level 1	- All uses.	- Intentionally added	Banned
Allowable concentration: Less than 900 ppm			
<i>Suggested Testing method: Use of GC/MS, GC/ECD (e.g. DIN 53313).</i>			

Substances: Hexabromocyclododecane (HBCDD)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose (e.g. those for the flame retardants contained in EPS and PP).	- Intentionally added	Banned
Allowable concentration: Less than 900 ppm			
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Other brominated organic compounds			
Targets			Effective date of the ban on the delivery
Level 3	- The flame retardants contained in plastics, or used for PCBs		N/A

Substances: Antimony – CAS No. 7440-36-0			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 1000 ppm of homogenous material	Banned

<i>Tributyltin compounds (TBT), Triphenyltin compounds (TPT), Tricyclohexyltin (TCyT) compounds and Tri-n-octyltin (TOT) compounds</i>			
<i>Metal tin, tin alloys, tin plating and tin inorganic compounds do not fall under this category</i>			
Targets		Control limits	Effective date of the ban on the delivery

Level 1	- All uses (e.g. paints, inks, preservatives, and fungicides)	- Intentionally added - 1000 ppm of homogenous material	Banned
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Dibutyltin (DBT) compounds			
<i>Metal tin, tin alloys, tin plating and tin inorganic compounds do not fall under this category</i>			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. additives for plastic) Materials whose tin concentration is 0.1 wt% or more	- 1000 ppm of homogenous material	Banned
Level 2	- Catalyst for paints or coating agents	- 1000 ppm of homogenous material	July 1, 2014
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Dioctyltin (DOT) compounds			
<i>Metal tin, tin alloys, tin plating and tin inorganic compounds do not fall under this category</i>			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Textile whose tin concentration is 0.1 wt% or more	- 1000 ppm of homogenous material	Banned
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Asbestos			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. insulators and filters)	- Intentionally added	Banned
<i>Suggested Testing method: Use of FTIR.</i>			

Substances: Specific azo compounds			
Azodyes that form any of the amine compounds listed in Table 5.2a through the decomposition methods cited in the EU Directive 76/769/EEC and amine compounds in Table 5.2a			
	Targets	Control limits	Effective date of the ban on the delivery
Level 1	The substances which are used in parts or articles that may come into direct and prolonged contact with human skin (e.g. belts, traps, ear phones, head phones, and shoulder pads for bags)	- 30 ppm of homogenous material	Banned
Level 3	The parts or articles that do not come into continuous contact with human skin (e.g. cushion, mice, remote commanders, and carrying bags)		N/A
<p><i>Test methods (for reference)</i></p> <p>The methods for decomposing azo compounds and then extracting amines are as follows:</p> <ol style="list-style-type: none"> 1) EN 14362-1:2003, "Textile – Methods for the determination of certain aromatic amines derived from azo colorants – Part 1: Detection of the use of certain azo colorants assessable without extraction"; 2) CEN ISO/TS 17234:2003, "Leather – Chemical tests – Determination of certain azo colorants in dyed leathers"; and 3) EN 14362-2:2003, "Textile – Methods for the determination of certain aromatic amines derived from azo colorants – Part 2: Detection of the use of certain azo colorants assessable by extracting the fibers". 			

Table 5.2a List of specific amine compounds

Amine compounds	CAS Number
4-aminoazobenzene	60-09-3
o-anisidine	90-04-0
2-naphthylamine	91-59-8
3,3-dichlorobenzidine	91-94-1
4-aminodiphenyl	92-67-1
Benzidine	92-87-5
ortho-toluidine	95-53-4
4-chloro-o-toluidine	95-69-2
2,4-toluenediamine	95-80-7
ortho-Aminoazotoluene	97-56-3
5-nitro-o-toluidine	99-55-8
4,4-methylene-bis-(2-chloroaniline)	101-14-4
4,4-diaminodiphenylmethane	101-77-9
4,4-oxydianiline	101-80-4
p-chloroaniline	106-47-8
3,3-dimethoxybenzidine	119-90-4
3,3-dimethylbenzidine	119-93-7
p-cresidine	120-71-8
2,4,5-trimethylaniline	137-17-7
4,4-thiodianiline	139-65-1

2,4-diaminoanisoole	615-05-4
3,3-dmethyl-4,4-diaminodiphenylmethane	838-88-0

Substances: Formaldehyde			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	The wooden products made from fiberboard, particleboard, or plywood, which are employed in products for import into Europe (e.g. speakers and racks)	- Details as below.	Banned
	The wooden products made from fiberboard, particleboard, or plywood, which are employed in products for destination other than Europe (e.g. speakers and racks)		
	All IC products	0.1 ppm	Banned
<p><i>Reference value (emission content): Obtain the value by any one of the following methods.</i></p> <p>1) <i>[With a chamber method]</i></p> <p><i>Concentration in the air: Equal to or less than 0.1 ppm (or 0.124 mg/m³) in an air-tight test chamber whose volume is 12 m³, 1 m³ or 0.0225 m³</i></p> <p>2) <i>[With a perforator method]</i></p> <ul style="list-style-type: none"> - <i>Equal to or less than 6.5 mg in 100 g of a particleboard without a surface treatment (the average value during six months)</i> - <i>Equal to or less than 7.0 mg in 100 g of a fiberboard without a surface treatment (the average value during six months)</i> - <i>Equal to or less than 8.0 mg in 100 g of a particleboard/ fiberboard without a surface treatment (the value derived from the one-time measurement based on EN 120)</i> <p>3) <i>[With a desiccators method]</i></p> <ul style="list-style-type: none"> - <i>Average content: 0.5 mg/l or less</i> - <i>Maximum content: 0.7 mg/l or less</i> <p><i>(Use N=2 to check the average and maximum values.)</i></p>			
<p>Measurement methods:</p> <ul style="list-style-type: none"> - A chamber method specified in EN 717-1:2004 (Wood based panels; determination of formaldehyde release; formaldehyde emission by the chamber method) - A perforator method specified in EN 120 (Wood based panels; determination of formaldehyde content; extraction method called perforated method; EN 120:1992) - A desiccators method specified in JIS A 5905 (Fiberboards) and JIS A 5908 (Particleboards) 			

Substances: Polyvinyl chloride (PVC) and PVC blends

Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned
<i>Suggested Testing method: Use of FTIR.</i>			

Substances: Beryllium			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned
Exemption	Use in beryllium copper alloy		N/A

Substances: Beryllium oxide			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned

Substances: Beryllium copper			
Targets			Effective date of the ban on the delivery
Level 3	- All uses		N/A

Substances: Specific phthalates (DEHP, DBP, BBP, DINP, DIDP, DNOP, DNHP, DIBP, Bis(2-methoxyethyl)phthalate, 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich and 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters, 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear, DIPP, N-pentyl-isopentylphthalate, DPP)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned
<i>Suggested Testing method: IEC 62321-8:2017, GC/MS.</i>			

Table 5.2b List of specific phthalates (phthalic esters)

Abbreviation	CAS Number	Specific phthalates
DEHP	117-81-7	Di (2-ethylhexyl) phthalate
DBP	84-74-2	Di-n-butyl phthalate
BBP	85-68-7	Butyl benzyl phthalate
DINP	28553-12-0 68515-48-0	Diisononyl phthalate (technical mixture)
DIDP	26761-40-0 68515-49-1	Diisodecyl phthalate (technical mixture)
DNOP	117-84-0	Di-n-octyl phthalate
DNHP	84-75-3	Di-n-hexyl phthalate
DIBP	84-69-5	Diisobutyl phthalate
DMEP	117-82-8	Bis(2-methoxyethyl)phthalate
DIHP	71888-89-6	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich
DHNUP	68515-42-4	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters
-	84777-06-6	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear
DIPP	605-50-5	Diisopentylphthalate
-	776297-69-9	N-pentyl-isopentylphthalate
DPP	131-18-0	Dipentyl phthalate

Substances: Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses (e.g. refrigerant and insulation)	- Intentionally added	Banned
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Ozone depletion substances (ODS)			
Targets		Control limits	Effective date of

			the ban on the delivery
Level 1	- Packaging materials - All uses (e.g. coolant, propellant in manufacturing of packaging materials and cleaning solvent).	- Intentionally added	Banned
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Radioactive materials			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned

Substances: Brominated dioxins/furans and Chlorinated dioxins/furans			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned

Substances: Ethylene Glycol Monomethyl Ether, Ethylene Glycol Monoethyl Ether and its acetate			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- 5 ppm in homogenous material	Banned

Substances: Arsenic			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All use except semiconductor and copper foil for PCB and FPC	- 1000 ppm in homogenous material	Banned

Substances: Halogenated aromatic substances			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Prohibited from use in capacitors and transformers	- 500 ppm for mono- or 50 ppm for poly-halogenated aromatic substances	Banned

Substances: Halogenated diphenyl methanes			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses	- Intentionally added	Banned
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Perfluorooctane sulfonates (PFOS)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All uses except those specified in Exemption	- Intentionally added	Banned
Exemption	- Photographic films for professional use - Resists for semiconductors		N/A
<i>Suggested Testing method: Use of LC/MS.</i>			

Substances: Specific benzotriazole			
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Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Ultraviolet protectants and ultraviolet absorbers applied to decorative laminate, developing papers, molded plastic parts	- Intentionally added	Banned

Substances: Surfactants (DTDMAC, DODMAC/DSDMAC and DHTDMAC)			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All Purpose (e.g. softener).	- 1000 ppm (sum of surfactants).	N/A

Substances: Perfluorooctyl acid and individual salts and esters of PFOA			
Targets			Effective date of the ban on the delivery
Level 1	- All purpose except those classified at "Exemption".	- Intentionally added	N/A
Exemption	- Photographic coating applied to films, papers, or printing plates		
<i>Suggested Testing method: Use of LC/MS.</i>			

Substances: Bisphenol A			
Targets			Effective date of the ban on the delivery
Level 3	- All purpose (excluding epoxy resin, polycarbonate and other plastics).		N/A
<i>Allowable concentration: Less than 50 ppm.</i>			
<i>Suggested Testing method: Use of GC/MS.</i>			

Substances: Pentachlorophenol (PCP)			
Targets			Effective date of the ban on the delivery
Level 3	- All purpose (e.g. preservative and pesticide).		N/A

Suggested Testing method: Use of GC/MS.

Substances: Triclosan		
Targets		Effective date of the ban on the delivery
Level 3	- All purpose (e.g. antibacterial and pesticide).	N/A
Allowable concentration: Less than 10 ppm.		
Suggested Testing method: Use of GC/MS.		

Substances: Cobalt dichloride			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Moisture indicator used for a desiccant agent (e.g. silica gel) - Humidity indicator card which is impregnated with cobalt dichloride	- Intentionally added	Banned

Substances: Dimethyl fumarate (DMF) – CAS No. 624-49-7			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose (e.g. antibacterial and pesticide).	- Intentionally added	Banned

Substances: Hexachlorobenzene – CAS No. 118-74-1			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Aldrin – CAS No. 309-00-2			
Targets		Control limits	Effective date of the ban on the

			delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Dieldrin – CAS No. 60-57-1

	Targets	Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Endrin – CAS No. 72-20-8

	Targets	Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: DDT – CAS No. 50-29-3

	Targets	Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Chlordanes – CAS No. 57-74-9

	Targets	Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: N,N-ditoly-p-phenylenediamine, N-tolyl-N-xy-p-phenylenediamine and N,N-dixylyl-p-phenylenedimine

	Targets	Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: 2,4,6-tri-tert-butylphenol – CAS No. 732-26-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Toxaphene – CAS No. 8001-35-2			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Mirex – CAS No. 2385-85-5			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Kelthane – CAS No. 115-32-2			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Hexachlorobutadiene – CAS No. 87-68-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: 2(2H-benzotriazol-2-yl)-4,6-di-tert-butylphenol – CAS No. 3846-71-7			
Targets		Control limits	Effective date of the ban on the delivery

Level 1	- All purpose.	- Intentionally added	Banned
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Substances: Red phosphorus (mutch) – CAS No. 12185-10-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Benzidine – CAS No. 92-87-5			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: 4-Aminophenyl and its salt			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: 4-Nitrobiphenyl and its salts – CAS No. 92-93-3 etc.			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Bis(chloromethyl)ether – CAS No. 542-88-1			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: β-Naphthylamine and its salts – CAS No. 91-59-8 etc.			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Rubber cement containing benzene (over 5%)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Polycyclic Aromatic Hydrocarbons (PAHs)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- See below in details	Banned

Table 5.2c Limits for Polycyclic Aromatic Hydrocarbons (PAHs)

Parameter	Category 1	Category 2
	Materials with foreseeable contact to skin for longer than 30 seconds (long-term skin contact) and toys not covered by category 1	Materials with foreseeable contact to skin up to 30 seconds (short term skin contact)
Benzo[a]pyren, Benzo[e]pyrene, Benzo[a]anthracene, Chrysen, Benzo[b]fluoranthene, Benzo[j]fluoranthene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Benzo[g,h,i]perylene, Indeno[1,2,3-c,d]pyrene (ppm)	0.5	1
Naphthalene (ppm)	2	10

Sum of Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Pyrene, Anthracene, Fluoranthene (ppm)	10	50
Sum 18 PAH (ppm)	10	50

Table 5.2d List of 18 PAHs

PAHs	CAS Number
Naphthalene	91-20-3
Acenaphthylene	208-96-8
Acenaphthene	83-32-9
Fluorene	86-73-7
Phenanthrene	85-01-8
Anthracene	120-12-7
Fluoranthene	206-44-0
Pyrene	129-00-0
Benzo(a)anthracene	56-55-3
Chrysene	218-01-9
Benzo(b)fluoranthene	205-99-2
Benzo(k)fluoranthene	207-08-9
Benzo(a)pyrene	50-32-8
Dibenz(a,h)anthracene	53-70-3
Benzo(g,h,i)perylene	191-24-2
Indeno(1,2,3-cd)pyrene	193-39-5
Benzo[e]pyrene	192-97-2
Benzo[j]fluoranthene	205-82-3

Substances: Methylene diphenyl diisocyanate (MDI) - CAS 26447-40-5			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 1000 ppm in homogenous material	Banned

Substances: Nitrogen trifluoride - CAS 7783-54-2			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Pentachlorobenzene - CAS 608-93-5			
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Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Perchlorates			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 6 ppb (or (0.006 ppm) of homogenous material	N/A

Substances: Toulene - CAS 108-88-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All products.	10 ppm	Banned

Substances: Benzene - CAS 71-43-2			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All products.	0.1 ppm	Banned

Substances: Phosphine - CAS 7803-51-2			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All products.	0.1 ppm	Banned

Substances: Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene (BNST) – CAS 68921-45-9			
Targets		Control limits	Effective date of the ban on the

			delivery
Level 1	- Antioxidant additive in lubricants	- Intentionally added	Banned

Substances: n-Hexane – CAS 110-54-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Cleaning agent, degreaser in the manufacturing process is restricted to use	- 100 mg/m ³ (28ppm)	Banned

Substances: Antimicrobial and/or Biocidal Substances			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- Intentionally added	Banned

Substances: Diphenylamine, Substituted (SDPA)			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Anti-oxidants used in adhesives, resins and polymer coating, paper products.	- Intentionally added	Banned

Substances: Ethanol, 2-[(2-aminoethyl)amino] – CAS 111-41-1			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Paints, lacquers, varnishes, textile, corrosion inhibitors.	- Intentionally added	Banned

Substances: Chlorine bleaching agent/Chlorinate Organic Solvents			
Targets		Control limits	Effective date of the ban on the

			delivery
Level 1	- Packaging, Cleaning agent, degreaser in manufacturing processes.	- Intentionally added	Banned

Substances: Chlorobenzene – CAS 88-73-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 10 ppm of homogenous material	Banned

Substances: 1,2,4 Trichlorobenzene – CAS 120-82-1			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 1000 ppm of homogenous material	Banned

Substances: 2-(2-methoxyethoxy)ethanol (DEGME) – CAS 111-77-3			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 1000 ppm of homogenous material	Banned

Substances: 2-(2-butoxyethoxy)ethanol (DEGBE) – CAS 112-34-5			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- All purpose.	- 1000 ppm of homogenous material	Banned

Substances: Tris(2-chloroethyl) phosphate (TCEP) - CAS 115-96-8			
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Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Flame retardants used in plastics, resins, fabrics, and textile.	- 1000 ppm of homogenous material	Banned

Substances: Diarsenic trioxide, Diarsenic pentaoxide			
Targets		Control limits	Effective date of the ban on the delivery
Level 1	- Antifoam agents or fining agents for LCD panels (including cover glasses, touchscreen, and backlights).	- 1000 ppm of homogenous material	Banned

Substances: Boric acid, specific sodium borates			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All purpose.	- 1000 ppm of homogenous material	N/A

Table 5.2e List of boric acid and specific sodium borates

Name	CAS Number
Boric acid	10043-35-3
Boric acid	11113-50-1
Disodium tetraborate, anhydrous; Tetraboron disodium heptaoxide pentahydrate	12179-04-3
Disodium tetraborate, anhydrous; Tetraboron disodium heptaoxide	1330-43-4
Disodium tetraborate, anhydrous; Disodium tetraborate decahydrate; Borax	1303-95-4
Tetraboron disodium heptaoxide, hydrate	12267-73-1

Substances: 4-(1,1,3,3-tetramethylbutyl) phenol - CAS 140-66-9			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All purpose.	- 1000 ppm of homogenous material	N/A

Substances: Bis(2-methoxyethyl) ether - CAS 111-96-6			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All purpose.	- 1000 ppm of homogenous material	N/A

Substances: N,N-dimethylacetamide(DMAC) - CAS 127-19-5			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All purpose.	- 1000 ppm of homogenous material	N/A

Substances: Ethylene glycol dimethyl ether (EGDME) - CAS 110-71-4			
Targets		Control limits	Effective date of the ban on the delivery
Level 3	- All purpose.	- 1000 ppm of homogenous material	N/A

5.2 **Additional Requirement from Regulation (EC) No 1907/2006 – Registration, Evaluation, Authorization & Restriction of Chemicals (REACH)**

All suppliers are required to notify Synaptics of all Substances of Very High Concern (“SVHCs”) as listed in below Table 5.3 in articles. The following details on each SVHC in each article are necessary to be provided by suppliers, in order for Synaptics to be able to fulfill its obligations (Article 33 of REACH):

<http://echa.europa.eu/web/guest/candidate-list-table>

- a) substance name (using IUPAC nomenclature or other international name)
- b) other names (usual name, trade name, abbreviation)
- c) CAS name and number (if available)
- d) EINECS or ELINCS number (if available and appropriate)
- e) concentration in article (weight by weight)
- f) use of substance in the article

- g) classification of the SVHC
 h) pre-registration number (if appropriate and known)

All suppliers are also necessary to provide material composition (e.g. MSDS, MDS, SDS, etc.) to Synaptics.

Table 5.3.Substances of Very High Concern (“SVHCs”)

No.	Substances	CAS No. / EC No.	Date of inclusion
1	Cobalt dichloride	7646-79-9 / 231-589-4	10/28/2010
2	Sodium dichromate	7789-12-0 or 10588-01-9 / 234-190-3	10/28/2010
3	Diarsenic pentaoxide	1303-28-2 / 215-116-9	10/28/2010
4	Diarsenic trioxide	1327-53-3 / 215-481-4	10/28/2010
5	Lead hydrogen arsenate	7784-40-9 / 232-064-2	10/28/2010
6	Triethyl arsenate	15606-95-8 / 427-700-2	10/28/2010
7	Dibutyl phthalate (DBP)	84-74-2 / 201-557-4	10/28/2010
8	Bis (2-ethyl(hexyl)phthalate) (DEHP)	117-81-7 / 204-211-0	10/28/2010
9	Benzyl butyl phthalate (BBP)	85-68-7 / 201-622-7	10/28/2010
10	Anthracene	120-12-7 / 204-371-1	10/28/2010
11	Bis(tributyltin) oxide (TBTO)	56-35-9 / 200-268-0	10/28/2010
12	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2 / 201-329-4	10/28/2010
13	Hexabromocyclododecane (HBCDD)	25637-99-4 / 247-148-4	10/28/2010
14	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8 / 287-476-5	10/28/2010
15	4,4'-Diaminodiphenylmethane (MDA)	101-77-9 / 202-974-4	10/28/2010
16	Anthracene oil	90640-80-5 / 292-602-7	1/13/2010
17	Anthracene oil, anthracene paste, distn. lights	91995-17-4 / 295-278-5	1/13/2010
18	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2 / 295-275-9	1/13/2010
19	Anthracene oil, anthracene-low	90640-82-7 / 292-604-8	1/13/2010
20	Anthracene oil, anthracene paste	90640-81-6 / 292-603-2	1/13/2010
21	Coal tar pitch, high temperature	65996-93-2 / 266-028-2	1/13/2010
22	2,4-Dinitrotoluene	121-14-2 / 204-450-0	1/13/2010
23	Diisobutyl phthalate	84-69-5 / 201-553-2	1/13/2010

24	Lead chromate	7758-97-6 / 231-846-0	1/13/2010
25	Lead chromate molybdate sulphate red	12656-85-8 / 235-759-9	1/13/2010
26	Lead sulfochromate yellow	1344-37-2 / 215-693-7	1/13/2010
27	Tris(2-chloroethyl)phosphate	115-96-8 / 204-118-5	1/13/2010
28	Acrylamide	79-06-1 / 201-173-7	3/30/2010
29	Ammonium dichromate	7789-09-5 / 232-143-1	6/18/2010
30	Boric acid	10043-35-3 or 11113-50-1 / 233-139-2 or 234-343-4	6/18/2010
31	Disodium tetraborate, anhydrous	1303-96-4 or 1330-43-4 or 12179-04-3 / 215-540-4	6/18/2010
32	Potassium chromate	7789-00-6 / 232-140-5	6/18/2010
33	Potassium dichromate	7778-50-9 / 231-906-6	6/18/2010
34	Sodium chromate	7775-11-3 / 231-889-5	6/18/2010
35	Tetraboron disodium heptaoxide, hydrate	12267-73-1 / 235-541-3	6/18/2010
36	Trichloroethylene	79-01-6 / 201-167-4	6/18/2010
37	Cobalt(II) sulphate	10124-43-3 / 233-334-2	12/15/2010
38	Cobalt(II) dinitrate	10141-05-6 / 233-402-1	12/15/2010
39	Cobalt(II) carbonate	513-79-1 / 208-169-4	12/15/2010
40	Cobalt(II) diacetate	71-48-7 / 200-755-8	12/15/2010
41	2-Methoxyethanol	109-86-4 / 203-713-7	12/15/2010
42	2-Ethoxyethanol	110-80-5 / 203-804-1	12/15/2010
43	Chromium trioxide	1333-82-0 / 215-607-8	12/15/2010
44	Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid	7738-94-5 / 231-801-5 - / - 13530-68-2 / 236-881-5	12/15/2010
45	2-Ethoxyethyl acetate	111-15-9 / 203-839-2	6/20/2011
46	Strontium chromate	7789-06-2 / 232-142-6	6/20/2011
47	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUF)	685151-42-4 / 271-084-6	6/20/2011
48	Hydrazine	7803-57-8, 302-01-2 / 206- 114-9	6/20/2011
49	1-Methyl-2-pyrrolidone	872-50-4 / 212-828-1	6/20/2011
50	1,2,3-Trichloropropane	96-18-4 / 202-486-1	6/20/2011
51	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl	71888-89-6 / 276-158-1	6/20/2011

	esters, C7-rich (DIHP)		
52	Lead dipicrate	6477-64-1 / 229-335-2	12/19/2011
53	Lead styphnate	15245-44-0 / 239-290-0	12/19/2011
54	Lead diazide, Lead azide	13424-46-9 / 236-542-1	12/19/2011
55	Phenolphthalein	77-09-8 / 201-004-7	12/19/2011
56	2,2'-Dichloro-4,4'-methylenedianiline	101-14-4 / 202-918-9	12/19/2011
57	N,N-dimethylacetamide	127-19-5 / 204-826-4	12/19/2011
58	Trilead diarsenate	3687-31-8 / 222-979-5	12/19/2011
59	Calcium arsenate	7778-44-1 / 231-904-5	12/19/2011
60	Arsenic acid	7778-39-4 / 231-901-9	12/19/2011
61	Bis(2-methoxyethyl) ether	111-96-6 / 203-924-4	12/19/2011
62	1,2-dichloroethane	107-06-2 / 203-458-1	12/19/2011
63	4-(1,1,3,3-Tetramethylbutyl)phenol; 4-tert-octyl phenol	140-66-9 / 205-426-2	12/19/2011
64	2-Methoxyaniline; o-Anisidine	90-04-0 / 201-963-1	12/19/2011
65	Bis(2-methoxyethyl) phthalate	117-82-8 / 204-212-6	12/19/2011
66	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4 / 500-036-1	12/19/2011
67	Zirconia Aluminosilicate Refractory Ceramic Fibres are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm). c) alkaline oxide and alkali earth oxide (Na ₂ O+K ₂ O+CaO+MgO+BaO) content less or equal to 18% by weight	-	12/19/2011
68	Aluminosilicate Refractory Ceramic Fibres are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following	-	12/19/2011

	<p>conditions:</p> <p>a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges</p> <p>b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm)</p> <p>c) alkaline oxide and alkali earth oxide (Na₂O+K₂O+CaO+MgO+BaO) content less or equal to 18% by weight</p>		
69	Pentazinc chromate octahydroxide	49663-84-5 / 256-418-0	12/19/2011
70	Potassium hydroxyoctaoxodizincatedichromate	11103-86-9 / 234-329-8	12/19/2011
71	Dichromium tris(chromate)	24613-89-6 / 246-356-2	12/19/2011
72	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	6786-83-0 / 229-851-8	06/18/2012
73	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1 / 202-959-2	06/18/2012
74	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC)	59653-74-6 / 423-400-0	06/18/2012
75	Diboron trioxide	1303-86-2 / 215-125-8	06/18/2012
76	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2 / 203-977-3	06/18/2012
77	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	561-41-1 / 209-218-2	06/18/2012
78	Lead(II) bis(methanesulfonate)	17570-76-2 / 401-750-5	06/18/2012
79	Formamide	75-12-7 / 200-842-0	06/18/2012
80	4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	548-62-9 / 208-953-6	06/18/2012
81	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4 / 203-794-9	06/18/2012
82	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	2580-56-5 / 219-943-6	06/18/2012
83	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	2451-62-9 / 219-514-3	06/18/2012
84	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	90-94-8 / 202-027-5	06/18/2012

85	Bis(pentabromophenyl) ether (DecaBDE)	1163-19-5 / 214-604-9	12/19/2012
86	Pentacosafuorotridecanoic acid	72629-94-8 / 276-745-2	12/19/2012
87	Tricosafuorododecanoic acid	307-55-1 / 206-203-2	12/19/2012
88	Henicosafuoroundecanoic acid	2058-94-8 / 218-165-4	12/19/2012
89	Heptacosafuorotetradecanoic acid	376-06-7 / 206-803-4	12/19/2012
90	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3 / 204-650-8	12/19/2012
91	Cyclohexane-1,2-dicarboxylic anhydride, cis-cyclohexane-1,2-dicarboxylic anhydride, trans-cyclohexane-1,2-dicarboxylic anhydride	85-42-7, 13149-00-3 or 14166-21-3 / 201-604-9, 236-086-3 or 238-009-9	12/19/2012
92	Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride	25550-51-0, 19438-60-9, 48122-14-1 or 57110-29-9 / 247-094-1, 243-072-0, 256-356-4 or 260-566-1	12/19/2012
93	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated	-	12/19/2012
94	4-Nonylphenol, branched and linear	-	12/19/2012
95	Methoxyacetic acid	625-45-6 / 210-894-6	12/19/2012
96	N,N-dimethylformamide	68-12-2 / 200-679-5	12/19/2012
97	Dibutyltin dichloride (DBTC)	683-18-1 / 211-670-0	12/19/2012
98	Lead monoxide (Lead oxide)	1317-36-8 / 215-267-0	12/19/2012
99	Orange lead (Lead tetroxide)	1314-41-6	12/19/2012
100	Lead bis(tetrafluoroborate)	13814-96-5 / 237-486-0	12/19/2012
101	Trilead bis(carbonate)dihydroxide	1319-46-6 / 215-290-6	12/19/2012
102	Lead titanium trioxide	12060-00-3 / 235-038-9	12/19/2012
103	Lead titanium zirconium oxide	12626-81-2 / 235-727-4	12/19/2012
104	Silicic acid, lead salt	11120-22-2 / 234-363-3	12/19/2012
105	Silicic acid (H ₂ Si ₂ O ₅), barium salt (1:1), lead-doped	68784-75-8 / 272-271-5	12/19/2012
106	1-bromopropane (n-propyl bromide)	106-94-5 / 203-445-0	12/19/2012
107	Methyloxirane (Propylene oxide)	75-56-9 / 200-879-2	12/19/2012
108	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0 / 284-032-2	12/19/2012
109	Diisopentylphthalate (DIPP)	605-50-5 / 210-088-4	12/19/2012
110	N-pentyl-isopentylphthalate	776297-69-9 / -	12/19/2012
111	1,2-diethoxyethane	629-14-1 / 211-076-1	12/19/2012
112	Acetic acid, lead salt, basic	51404-69-4 / 257-175-3	12/19/2012

113	Lead oxide sulfate	12036-76-9 / 234-853-7	12/19/2012
114	[Phthalato(2-)]dioxotrilead	69011-06-9 / 273-688-5	12/19/2012
115	Dioxobis(stearato)trilead	12578-12-0 / 235-702-8	12/19/2012
116	Fatty acids, C16-18, lead salts	91031-62-8 / 292-966-7	12/19/2012
117	<i>Lead cynamidate</i>	20837-86-9 / 244-073-9	12/19/2012
118	Lead dinitrate	10099-74-8 / 233-245-9	12/19/2012
119	Pentalead tetraoxide sulphate	12065-90-6 / 235-067-7	12/19/2012
120	Pyrochlore, antimony lead yellow	8012-00-8 / 232-382-1	12/19/2012
121	Sulfurous acid, lead salt, dibasic	62229-08-7 / 263-467-1	12/19/2012
122	Tetraethyllead	78-00-2 / 201-075-4	12/19/2012
123	Tetralead trioxide sulphate	12202-17-4 / 235-380-9	12/19/2012
124	Trilead dioxide phosphonate	12141-20-7 / 235-252-2	12/19/2012
125	Furan	110-00-9 / 203-727-3	12/19/2012
126	Diethyl sulphate	64-67-5 / 200-589-6	12/19/2012
127	Dimethyl sulphate	77-78-1 / 201-058-1	12/19/2012
128	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2 / 421-150-7	12/19/2012
129	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7 / 201-861-7	12/19/2012
130	4,4'-methylenedi-o-toluidine	838-88-0 / 212-658-8	12/19/2012
131	4,4'-oxydianiline and its salts	101-80-4 / 202-977-0	12/19/2012
132	4-aminoazobenzene	60-09-3 / 200-453-6	12/19/2012
133	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	85-80-7 / 202-453-1	12/19/2012
134	6-methoxy-m-toluidine (p-cresidine)	120-71-8 / 204-419-1	12/19/2012
135	Biphenyl-4-ylamine	92-67-1 / 202-177-1	12/19/2012
136	o-aminoazotoluene [(4-o-tolylazo-o-toluidine)]	97-56-3 / 202-591-2	12/19/2012
137	o-toluidine	95-53-4 / 202-429-0	12/19/2012
138	N-methylacetamide	79-16-3 / 201-182-6	12/19/2012
139	Cadmium	7440-43-9 / 231-152-8	06/20/2013
140	Cadmium oxide	1306-19-0 / 215-146-2	06/20/2013
141	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1 / 223-320-4	06/20/2013
142	Pentadecafluorooctanoic acid (PFOA)	335-67-1 / 206-397-9	06/20/2013
143	Dipentyl phthalate (DPP)	131-18-0 / 205-017-9	06/20/2013

144	4-Nonylphenol, branched and linear, ethoxylated	-	06/20/2013
145	Cadmium sulphide	1306-23-6 / 215-147-8	12/16/2013
146	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7 / 217-710-3	12/16/2013
147	Dihexyl phthalate	84-75-3 / 201-559-5	12/16/2013
148	Imidazolidine-2-thione; (2-imidazoline-2-thiol)	96-45-7 / 202-506-9	12/16/2013
149	Trixylyl phosphate	25155-23-1 / 246-677-8	12/16/2013
150	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0 / 209-358-4	12/16/2013
151	Lead di(acetate)	301-04-2 / 206-104-4	12/16/2013
152	Cadmium chloride	10108-64-2 / 233-296-7	06/16/2014
153	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4 / 271-093-5	06/16/2014
154	Sodium peroxometaborate	7632-04-4 / 231-556-4	06/16/2014
155	Sodium perborate; perboric acid, sodium salt	- / 234-390-0; 239-172-9	06/16/2014
156	Cadmium fluoride	7790-79-6 / 232-222-0	12/17/2014
157	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	- / -	12/17/2014
158	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1 / 239-622-4	12/17/2014
159	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7 / 223-346-6	12/17/2014
160	Cadmium sulphate	10124-36-4 , 31119-53-6 / 233-331-6	12/17/2014
161	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1 / 247-384-8	12/17/2014
162	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5, 68648-93-1 / 271-094-0, 272-013-1	6/15/2015
163	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof]	- / -	6/15/2015
164	1,3-propanesultone	1120-71-4 / 214-317-9	12/17/2015

165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1 / 223-383-8	12/17/2015
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3 / 253-037-1	12/17/2015
167	Nitrobenzene	98-95-3 / 202-716-0	12/17/2015
168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1, 21049-39-8, 4149-60-4 / 206-801-3	12/17/2015
169	Benzo[def]chrysene(Benzo[a]pyrene)	50-32-8 / 200-028-5	6/20/2016
170	4,4'-isopropylidenediphenol (bisphenol A)	80-05-7 / 201-245-8	12/19/2016
171	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	3108-42-7, 335-76-2, 3830-45-3 / 206-400-3, 221-470-5	12/19/2016
172	4-Heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	- / -	12/19/2016
173	p-(1,1-dimethylpropyl) phenol = 4-tert-pentylphenol (PTAP)	80-46-6 / 201-280-9	12/19/2016
174	Perfluorohexane-1-sulphonic acid and its salts	- / -	7/7/2017
175	Benz[a]anthracene	56-55-3 / 200 280-6	1/15/2018
176	Cadmium carbonate	513-78-0 / 513-78-0	1/15/2018
177	Cadmium hydroxide	21041-95-2 / 244-168-5	1/15/2018
178	Cadmium nitrate	10325-94-7 / 233-710-6	1/15/2018
179	Chrysene	218-01-9 / 205-923-4	1/15/2018
180	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene (Dechlorane Plus™) [covering any of its individual anti- and syn-isomers or any combination thereof]	-	1/15/2018
181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥0.1% w/w 4-heptylphenol, branched and linear]	-	1/15/2018
182	Octamethylcyclotetrasiloxane(D4)	556-67-2 / 209-136-7	6/27/2018
183	Decamethylcyclopentasiloxane (D5)	541-02-6 / 208-764-9	6/27/2018
184	Dodecamethylcyclohexasiloxane (D6)	540-97-6 / 208-762-8	6/27/2018

185	Lead	7439-92-1 / 231-100-4	6/27/2018
186	Disodium octaborate	12008-41-2 / 234-541-0	6/27/2018
187	Benzo[ghi]perylene	191-24-2 / 205-883-8	6/27/2018
188	Terphenyl, hydrogenated	61788-32-7 / 262-967-7	6/27/2018
189	Ethylenediamine(EDA)	107-15-3 / 203-468-6	6/27/2018
190	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride, (TMA)	552-30-7 / 209-008-0	6/27/2018
191	Dicyclohexyl phthalate (DCHP)	84-61-7 / 201-545-9	6/27/2018
192	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one	15087-24-8 / 239-139-9	1/15/2019
193	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6 / 401-720-1	1/15/2019
194	Benzo[k]fluoranthene	207-08-9 / 205-916-6	1/15/2019
195	Fluoranthene	206-44-0; 93951-69-0 / 205-912-4	1/15/2019
196	Phenanthrene	85-01-8 / 201-581-5	1/15/2019
197	Pyrene	129-00-0; 1718-52-1 / 204-927-3	1/15/2019
198	2-Methoxyethyl acetate	110-49-6 / 203-772-9	7/16/2019
199	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with $\geq 0.1\%$ w/w of 4-nonylphenol, branched and linear (4-NP)	- / -	7/16/2019
200	2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides (covering any of their individual isomers and combinations thereof)	- / -	7/16/2019
201	4-Tert-butylphenol	98-54-4 / 202-679-0	7/16/2019
202	Perfluorobutane sulfonic acid (PFBS) and its salts	- / -	1/16/2020
203	Diisohexyl phthalate	71850-09-4 / 276-090-2	1/16/2020
204	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5 / 400-600-6	1/16/2020
205	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1 / 404-360-3	1/16/2020
206	1-vinylimidazole	1072-63-5 / 214-012-0	6/25/2020
207	2-methylimidazole	693-98-1 / 211-765-7	6/25/2020
208	Butyl 4-hydroxybenzoate	94-26-8 / 202-318-7	6/25/2020
209	Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4 / 245-152-0	6/25/2020

5.3 Requirements of Controlled Substances of packaging materials

5.3.1 Definition of “packaging materials”

Packaging materials are defined as products made from any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods from the producer to the user or consumer.

Note: The definition excludes the materials for the returnable boxes, which are reused or recycled under the control of carrier or parts supplier and are not disposed of by consumers or Synaptics.

Table 5.4. Additional rules for packaging materials

Substances: Heavy metals (cadmium, lead, mercury and hexavalent chromium)			
Targets		Control limits	Effective date of the ban on the delivery
- All packaging materials Some examples are given in PACKAGING of Table 5.3a.		Cumulative concentration of Cd, Pb, Hg, Cr (VI) – 100ppm	Banned immediately
Exemption	- Cartons for returnable boxes owned by parts suppliers	N/A	N/A

Substances: Ozone depletion substances (ODS)			
Targets			Effective date of the ban on the delivery
Level 1	- All packaging materials (e.g. foam plastic: Styrofoam, bubble foam, cushion and etc.)		Banned immediately

Table 5.4a Illustrative examples of PACKAGING materials

Note: The following lists provide some examples of the products, which are categorize as “packaging” as well as “not packaging”, to serve as a reference. They are not intended to include all products in both categories.

For devices, semiconductors and other components		
PACKAGING		
1.	Magazine stick	Such as used for ASIC
2.	Stopper	
3.	Tray	
4.	Reel	

5.4 Requirements of Controlled Substances in Manufacturing Processes

Table 5.5

Item	Substance	Control Limits
1	Benzene	0.1 ppm
2	Ozone Depleting Substances	Not Detected
3	n-Hexane	100 mg/m ³ (28 ppm)
4	Beryllium Dust and Fumes	0.0002 mg/m ³
5	Chlorine bleaching agent/Chlorinated Organic Solvents	Not Detected
6	N-Methylpyrrolidone (NMP)	Breathing zone < 40 mg/m ³ (10 ppm)

5.5 Requirements of China VOC requirements (GB 33372-2020 for Adhesive, GB 38507-2020 for Printing Ink, GB 38508-2020 Cleaning Agents and GB 30981-2020 for Industrial Protective Coating)

5.5.1 For listed raw materials and its manufacturing processes in China, they should comply with the related China VOC requirements before the effective date.

Table 5.6. China VOC standards for Adhesive, Printing Ink, Cleaning Agents and Industrial Protective Coating.

No.	Name of Standard	Issue Date	Effective Date	Scope (for details pls refer to the standards)
1	GB 33372-2020 Limit of volatile organic compounds content in adhesive	3/4/2020	12/1/2020	Adhesive
2	GB 38507-2020 Limits of volatile organic compounds(VOCs) in printing ink	3/4/2020	4/1/2021	Printing ink in factory (except additive, thinners, etc. used to adjust the performance of printing inks during printing)
3	GB 38508-2020 Limits for volatile organic compounds content in cleaning agents	3/4/2020	12/1/2020	Cleaning Agents produced and used in industrial production and operations, except semiconductor

				(integrated circuit) manufacturing.
4	GB 30981-2020 Limit of harmful substances of industrial protective coatings	3/4/2020	12/1/2020	Industrial Protective coating used for protecting the surface of metal, concrete and plastics, etc.

6 Demonstrating of Compliance

- 6.1 Suppliers must provide test reports of Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr6+), Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDEs), Di(2-ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Di-n-butyl phthalate (DBP) and Diisobutyl phthalate (DIBP) at a homogeneous material level and signed Declaration of non-use (P/N: 534-000438-01) to demonstrate compliance with this specification. Test reports must be provided to Synaptics upon initial part delivery.
- 6.2 In addition, suppliers should provide the test report as per specific customer requirements.
- 6.3 All document must meet the following requirements:
 - 6.3.1 Test reports, signed Declaration of non-use must be less than one year old from the date of issue.
 - 6.3.2 To fully demonstrate a product is RoHS complaint, it is necessary to show test result of each Homogenous material of the test sample.
 - 6.3.3 All test sample must be mechanically dissembled based on the concept of homogenous materials before test unless a test unit is less than 4mm³ in volume or could not be mechanically disjointed.
 - 6.3.4 Only test report of 3rd party ISO 17025 certified laboratory is acceptable. Testing must be performed according to the latest version of method IEC 62321.
 - 6.3.5 Test reports based on X-ray Fluorescence Spectroscopy (XRF) are not acceptable forms of compliance documentation.
 - 6.3.6 SDS and/or MDF are required to provide as per request.
 - 6.3.7 All the signed declaration, material test reports (including 3rd party lab test report & XRF incoming test report), technical documents (e.g. Data sheet, SOP, PCN, Product Drawing) and related info are required to keep over 10 years.
- 6.4 Suppliers should have Green Product Management System to manage material approval, incoming materials control (e.g. XRF Test, 3rd party report checking), process and inventory control, etc. For the suppliers have in-house XRF equipment, follow 526-000487-01.
- 6.5 Training of Management of Environment-Related Controlled Substances is required to take in every year as the regulatory and customer requirements are also updated annually.

7 Appendices

Appendix A Major Controlled Substances, and Examples of Applicable Laws and Regulations

Note: This information is confirmed as of December 2012. The laws and regulations cited herein are subjected to change, and it is essential to consult the latest editions of the relevant laws and regulations.

Substances	Laws and regulations
Cadmium and cadmium compounds	European Union. REACH Regulation (EC) No. 1907/2006
	European Union. RoHS Directive 2011/65/EU and its amendments.
	Switzerland. Ordinances on the reduction of risks linked to chemical products.
Lead and lead compounds	European Union. RoHS Directive 2011/65/EU and its amendments.
	Switzerland. Ordinances on the reduction of risks linked to chemical products.
	Denmark: Statutory Order No. 1012 and its amendments.
Mercury and mercury compounds	European Union. RoHS Directive 2011/65/EU and its amendments.
Hexavalent chromium its compounds	European Union. RoHS Directive 2011/65/EU and its amendments.
	Switzerland. Ordinances on the reduction of risks linked to chemical products.
Polychlorinated biphenyls	European Union. REACH Regulation (EC) No. 1907/2006
Polychlorinated naphthalenes (PCN)	Japan. Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, Class I.
Polychlorinated terphenyls (PCT)	
Short-chain chlorinated paraffins (SCCP)	European Union. REGULATION (EU) No 519/2012
	Norway. Regulations relating to restrictions on the use, etc. of certain dangerous chemicals.
Mirex (Perchlordecone)	(Japan) Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Class 1), etc.
Polybrominated biphenyls (PBB)	European Union. REACH Regulation (EC) No. 1907/2006
	European Union. RoHS Directive 2011/65/EU and its amendments.
	Switzerland. Ordinances on the reduction of risks linked to chemical products.
Polybrominated diphenyl ethers (PBDE)	European Union. REACH Regulation (EC) No. 1907/2006
	European Union. RoHS Directive 2011/65/EU and its amendments.
	Switzerland. Ordinances on the reduction of risks linked to chemical products.

Tetrabromobisphenol-A-bis(2,3-dibromopropylether) (TBBP-A-bis)	Netherlands. Regulation on Tetrabromobisphenol-A-bis(2,3-dibromopropylether) (TBBP-A-bis)
Tributyltin compounds (TBT) Triphenyltin compounds (TPT)	Japan. Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, Class I and Class II.
Dibutyltin (DBT) compounds	European Union. REACH Regulation (EC) No. 1907/2006
Diocetyl tin (DOT) compounds	European Union. REACH Regulation (EC) No. 1907/2006
Asbestos	Japan. Industrial Safety and Health Law.
	Germany. Chemicals Prohibition Ordinance. (German abbreviation: ChemVerbotsV)
Specific azo compounds	European Union. REACH Regulation (EC) No. 1907/2006
Formaldehyde	Germany. Chemicals Prohibition Ordinance. (German abbreviation: ChemVerbotsV)
	Denmark: Statutory Order No. 289.
Ozone depletion substances (ODS)	Montreal Protocol (on Substances that Deplete the Ozone Layer) and its amendments.
	European Union. EU regulation (EC) No. 2037/2000
	Japan. Law Concerning the Protection of the Ozone Layer through the Control of Specified Substances and Other Measures.
	United States. Clean Air Act Amendments of 1990.
	Republic of Indonesia. Regulation of the Minister of Industry of the Republic of Indonesia No. 33/M-IND/PER/4/2007 dated April 17, 2007
Heavy metals (lead, cadmium, mercury, and hexavalent chromium)	European Union. EU Directive 94/62/EC on packaging and packaging waste and its amendments.
	Toxics in Packaging Clearinghouse (TPCH), adopted by 19 states in United States
Beryllium Oxide	European Union. WEEE Directive 2012/19/EU and REGULATION (EC) No 1272/2008
Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)	European Union. Regulation 2006/842/EC.
	Denmark: Statutory Order No. 552.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem)
Perfluorooctane sulfonates (PFOS)	European Union. REGULATION (EU) No 757/2010
Specific benzotriazole	Japan. Law Concerning the Examination and Regulation of Manufacture of Chemical Substances, Class I.
Cobalt dichloride	European Union. REACH Regulation (EC) No. 1907/2006
Dimethyl Fumarate (DMF)	European Union. REACH Regulation (EC) No. 1907/2006.

Appendix B Typical Examples of Controlled Substances and Their Compounds

- Cadmium and cadmium compounds**

English Names	CAS No.	Chemical formulas	Main intended purposes
Cadmium	7440-43-9	Cd	Connection materials, surface treatment
Cadmium alloys			Low melting point solder, fuses, etc.
Cadmium oxide	1306-19-0	CdO	Pigments, alkaline batteries, and materials for chemical synthesis
Cadmium chloride	10108-64-2	CdCl ₂	Plating bath, the stabilizers used for plating and vinyl chloride
Cadmium sulfide	1306-23-6	CdS	Pigments, paints, inks, and light receiving elements for semiconductors
Cadmium nitrate	10325-94-7	Cd (NO ₃) ₂	Coloring agents, batteries, and photographs
Cadmium nitrate tetrahydrate	10022-68-1	Cd (NO ₃) ₂ - 4H ₂ O	
Cadmium sulfate	10124-36-4	CdSO ₄	NiCd batteries
Cadmium stearate	2223-93-0	Cd (C ₁₈ H ₃₅ O ₂) ₂	Stabilizers used for vinyl chloride
Other cadmium compounds			

- Lead and lead compounds**

English names	CAS No.	Chemical formulas	Main intended purposes
Lead; metal	7439-92-1	Pb	
Lead / Tin alloy	39412-44-7	Pb-Sn	Solder, Brazing materials, and electrical connection
Lead (II) oxide	1317-36-8	PbO	Pigments, colorings agents, rubber vulcanization accelerators, and solid lubricants
Lead (IV) oxide	1309-60-0	PbO ₂	Lead-acid batteries, rubber curing agents, and materials for pigments
Dilead Trioxide		Pb ₂ O ₃	
Lead (II, IV) oxide	1314-41-6	Pb ₃ O ₄	Pigments. Lead-acid batteries, glass, and paints
Lead azide	13424-46-9	PbN ₆	
Lead (II) fluoride	7783-46-2	PbF ₂	Special optical glass, pigments
Lead (II) chloride	7758-95-7	PbCl ₂	
Lead (IV) chloride	13463-30-4	PbCl ₄	
Lead (II) iodide	10101-63-0	PbI ₂	Bronze, printing and photographs
Lead (II) sulfide	1314-87-0	PbS	Infrared ray detectors in which semiconductor elements are utilized
Lead (II) cyanide	592-05-2	Pb (CN) ₂	Antirust pigments
Lead fluoroborate	13814-96-5	Pb (BF ₄) ₂	Plating bath, anticorrosive surface treatment
Lead fluosilicate	25808-74-6	PbSiF ₆	Plating bath, lead refinement

- Mercury and mercury compounds**

English names	CAS No.	Chemical formulas	Main intended purposes
Mercury	7439-97-6	Hg	Electrodes, mercury lamps
Mercury alloys; amalgam	15829-53-5		

Mercury oxide (I)	15829-53-5	Hg ₂ O	
Mercury (II) oxide	21908-53-2	HgO	Mercury cells, preservatives
Mercury (I) chloride	10112-91-1	Hg ₂ Cl ₂	Electrodes, pigments
Mercury (II) chloride	7487-94-7	HgCl ₂	Metal etching, batteries, and preservatives
Mercury (II) nitrate	10045-94-0	Hg(NO ₃) ₂	Felt, catalysts
Mercury (I) sulfate	7783-35-9	Hg ₂ SO ₄	Batteries
Mercury (II) fulminate	628-86-4	Hg(ONC) ₂	
Mercury (II) acetate	1600-27-7	Hg(CH ₃ COO) ₂	
Methylmercury salts	e. g. 22967-92-6	CH ₃ HgX; X=Cl, Br, I, OH etc.	Fungicides
Ethylmercury salts		C ₂ H ₅ HgX; X=Cl, Br, I, OH, etc.	Preservatives, disinfectants
Propylmercury salts		C ₃ H ₇ HgX; X=Cl, Br, I, OH, etc.	
Phenylmercury salts		C ₆ H ₅ HgX; X=Cl, Br, I, OH, etc.	Preservatives, disinfectants
Methoxyethyl-mercury salts		CH ₃ OC ₂ H ₄ HgX; X=Cl, Br, I, OH, etc.	Disinfectants, fungicides
Dialkylmercury		R ₂ Hg; R=alkyl group (C _n H _{2n+1})	
Diphenylmercury	587-85-9	(C ₆ H ₅) ₂ Hg	
Other Mercury compounds			

- Hexavalent chromium compounds**

English names	CAS No.	Chemical formulas	Main intended purposes
Chromium (VI) Oxide; Chromium trioxide	1333-82-0	CrO ₃	Pigments, catalysts, plating, and tanning
Lithium chromate	14307-35-8	Li ₂ CrO ₄	Corrosion prevention

Sodium chromate	7775-11-3	Na ₂ CrO ₄	Antirust, tanning
Potassium chromate	7789-00-6	K ₂ CrO ₄	Pigments, inks, and tanning
Potassium chlorochromate	16037-50-6	K [CrO ₃ Cl]	
Ammonium chromate	7788-98-9	(NH ₄) ₂ CrO ₄	Photographs, catalysts
Copper chromate	13548-42-0	CuCrO ₄	Mordants
Magnesium chromate	13423-61-5	MgCrO ₄	Antirust, surface treatment
Calcium chromate	13765-19-0	CaCrO ₄	Pigments, inks, and tanning
Strontium chromate	7789-06-2	SrCrO ₄	Pigments, antirust
Barium chromate	10294-40-3	BaCrO ₄	Pigments, corrosion prevention, and coloring agents for ceramics
Lead chromate; chrome yellow	1344-37-2	PbCrO ₄	Pigments, paints, and inks
Zinc chromate	12018-19-8; 13530-65-9; 14018-95-2	ZnCrO ₄	Pigments, anticorrosives
Sodium dichromate; sodium bichromate	10588-01-9	Na ₂ Cr ₂ O ₇	Pigments, photographs, tanning, corrosion prevention
Potassium dichromate; Potassium bichromate	7778-50-9	K ₂ Cr ₂ O ₇	Pigments, photographs, batteries, plating, and tanning
Ammonium dichromate; Ammonium bichromate	7789-09-5	(NH ₄) ₂ Cr ₂ O ₇	Pigments, photographs, and catalysts
Calcium dichromate; Calcium bichromate	14307-33-6	CaCr ₂ O ₇	Catalysts, corrosion prevention
Zinc dichromate; Zinc bichromate	14018-95-2	ZnCr ₂ O ₇	Pigments
Other hexavalent chromium compounds			

- Polybrominated biphenyls (PBB)**

English Name	CAS No.	Chemical formula	Main intended purposes
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Polybrominated biphenyls; PBBs	e.g. 67774-32-7	$C_{12}H_{10-x}Br_x$ ($x = 1-10$)	Flame retardants
Decabromobiphenyl	13654-09-6	$C_{12}Br_{10}$	Flame retardants
Nonabromobiphenyl	27753-52-2	$C_{12}HBr_9$	Flame retardants
Octabromobiphenyl	27858-07-7	$C_{12}H_2Br_8$	Flame retardants
Heptabromobiphenyl		$C_{12}H_3Br_7$	Flame retardants
Hexabromobiphenyl		$C_{12}H_4Br_6$	Flame retardants
Pentabromobiphenyl		$C_{12}H_5Br_5$	Flame retardants
Terabromobiphenyl		$C_{12}H_6Br_4$	Flame retardants
Tribromobiphenyl		$C_{12}H_7Br_3$	Flame retardants
Dibromobiphenyl		$C_{12}H_8Br_2$	Flame retardants
Monobromobiphenyl		$C_{12}H_9Br$	Flame retardants

• **Polybrominated diphenyl ethers (PBDE)**

English Names	CAS No.	Chemical formulas	Main intended purposes
Polybromodiphenyl ether; polybromodiphenyloxiide; polybrominated biphenyl ethers; PBDE; PBDO; PBBE		$C_{12}H_{10-x}Br_xO$ ($x = 1-10$)	Flame retarding materials
Decabromodiphenyl ether; decabromodiphenyloxiide; DBDPE; DBDPO; DecaBDE	1163-19-5	$C_{12}Br_{10}O$	Flame retardants (for PE, ABS and polyester)
Nonabromodiphenyl ether; nonabromodiphenyloxiide		$C_{12}HBr_9O$	Flame retardants
Octabromodiphenyl ether; octabromodiphenyloxiide	32536-52-0	$C_{12}H_2Br_8O$	Flame retardants (for ABS, HIPS, and LDPE)
Heptabromodiphenylether; heptabromodiphenyloxiide		$C_{12}H_3Br_7O$	Flame retardants
Hexabromodiphenylether; hexabromodiphenyloxiide	36483-60-0	$C_{12}H_4Br_6O$	Flame retardants
Pentabromodiphenylether; pentabromodiphenyloxiide	32354-81-9	$C_{12}H_5Br_5O$	Flame retardants
Tetrabromodiphenylether; tetrabromodiphenyloxiide		$C_{12}H_6Br_4O$	Flame retardants
Tribromodiphenylether; tribromodiphenyloxiide		$C_{12}H_7Br_3O$	Flame retardants

Dibromodiphenylether; dibromodiphenyloxyde		C ₁₂ H ₈ Br ₂ O	Flame retardants
Monobromodiphenylether; monobromodiphenyloxyde		C ₁₂ H ₉ BrO	Flame retardants

- Polychlorinated biphenyls**

English names	CAS No.	Chemical formula	Main intended purposes
; polychlorinated biphenyls	1336-36-3	C ₁₂ H _{10-x} Cl _x (x = 1–10)	Lubricants, heating mediums, and oils for capacitors

- Polychlorinated naphthalenes (PCN)**

English names	CAS No.	Chemical formulas	Main intended purposes
Polychlorinated naphthalene		C ₁₀ H _{8-x} Cl _x (x => 3)	Lubricants, preservatives, and paints
Trichloronaphthalenes	1321-65-9	C ₁₀ H ₅ Cl ₃	
Tetrachloronaphthalenes	1335-88-2	C ₁₀ H ₄ Cl ₄	
Pentachloronaphthalenes	1321-64-8	C ₁₀ H ₃ Cl ₅	
Octachloronaphthalenes	2234-13-1	C ₁₀ Cl ₈	

- Polychlorinated Terphenyls (PCT)**

English names	CAS No.	Chemical formulas	Main intended purposes
Polychlorinated terphenyls	61788-33-8	$C_{18}H_{14-x}Cl_x$ ($x = 1-14$)	Lubricants, preservatives, and paints

- Short-chain Chlorinated paraffins (SCCP) and Medium-chain Chlorinated paraffins (MCCP)**

English Name	CAS No.	Chemical formula	Main intended purposes
Short-chain Chlorinated paraffins C10-13, Cl => 50 wt%	e.g. 10871-26-2		Plasticizers, flame retardants
Medium-chain Chlorinated paraffins C14-17, Cl => 40 wt%	e.g. 85535-85-9		Plasticizers, flame retardants

- Tributyltin compounds (TBT), Triphenyltin compounds (TPT), Tricyclohexyltin (TCyT) compounds, Tri-n-octyltin (TOT) compounds.**

English names	CAS No.	Chemical formulas	Main intended purposes
Tributyl tin bromide	1461-23-0	$(C_4H_9)_3SnBr$	Disinfectants
Bis (tributyl tin) oxide	56-35-9	$C_{24}H_{54}Osn_2$	Disinfectants
Triphenyl tin	668-34-8	$(C_6H_5)_3Sn$	Disinfectants
Triphenyl tin bromide		$(C_6H_5)_3SnBr$	Disinfectants
Triphenyl tin chloride	639-58-7	$(C_6H_5)_3SnCl$	Disinfectants
Triphenyl tin hydroxide	76-87-9	$(C_6H_5)_3SnOH$	Disinfectants
Triphenyl tin N, N'- dimethyldithiocarbamate	1803-12-9	$(C_6H_5)_3Sn(CH_3)_2NCS_2$	
Triphenyl tin fluoride (fentin fluoride)	379-52-2	$(C_6H_5)_3SnF$	
Triphenyl tin acetate (fentin acetate)	900-95-8	$(C_6H_5)_3SnOCOCH_3$	
Triphenyl tin fatty acid salts	18380-71-7	No chemical formulas	
Triphenyl tin chloroacetate	7094-94-2	$(C_6H_5)_3SnOCOCH_2Cl$	
Tributyl tin methacrylate	2155-70-6	$(C_4H_9)_3SnC_4H_5O_2$	
Bis (tributyl tin) fumarate	6454-35-9	$C_2H_2(COO)_2([C_4H_9]_3Sn)_2$	
Tributyl tin fluoride	1983-10-4	$(C_4H_9)_3SnF$	
Bis (tributyl tin) 2, 3-dibromosuccinate	31732-71-5	$([C_4H_9]_3Sn)_2C_2H_2(BR)_2(COO)_2$	

Tributyl tin acetate	56-36-0	$(C_4H_9)_3SnOCOCH_3$	
Tributyl tin laurate	3090-36-6	$(C_4H_9)_3SnC_{12}H_{23}O_2$	
Bis (tributyl tin) phthalate	4782-29-0	$(C_6H_4)(COO)_2([C_4H_9]_3Sn)_2$	
Tributyl tin sulfamate	6517-25-5	$(C_4H_9)_3SnSO_3NH_2$	
Bis (tributyl tin) maleate	14275-57-1	$C_{28}H_{56}O_4Sn_2$	
Tributyl tin chloride	1461-22-9	$(C_4H_9)_3SnCl$	
Mixture of tributyl tin cyclopentanecarboxylate and its analogs (Tributyl tin naphthenate)	85409-17-12		
Mixture of tributyl tin 1, 2, 3, 4, 4a, 4b, 5, 6, 10, 10a-dacahydro-7-isopropyl-1, 4a-dimethyl-1 phenanthrenecarboxylate and its analogs (Tributyl tin rosin salts)	26239-64-5	$C_{32}H_{56}O_2Sn$	
Copolymer of alkyl acrylate, methyl Methacrylate (alkyl; C = 8)			

- Dibutyltin (DBT) Compounds**

English names	CAS No.	Chemical formulas	Main intended purposes
Dibutyltin oxide; Stannane, dibutyloxo-	818-08-6	$C_8H_{18}OSn$	Catalysts, Stabilizers, antioxidants
Dibutyltin dichloride; Stannane, dibutylchloro-	683-18-1	$C_8H_{18}Cl_2Sn$	
Dibutyltin dilaurate; Stannane, dibutylbis[(1-oxododecyl)oxy]-	77-58-7	$C_{32}H_{64}O_4Sn$	Catalysts, Stabilizers, antioxidants
Dibutyltin bis(benzyl maleate); Benzyl(Z,Z)-8,8-dibutyl-3,6,10-trioxo-1-1phenyl-2,7,9-trioxa-8-stannatrideca-4,11-dien-13-ozte;	7324-74-5	$C_{30}H_{36}O_8Sn$	Stabilizers
Dibutyltin maleate; 2,2-Dibutyl-1,3,2-dioxazannepin-4,7-dione	78-04-6	$C_{12}H_{20}O_4Sn$	Stabilizers, antioxidants
Dibutyltin di(aceate); Diacetic acid dibutyltin salt	1067-33-0	$C_{12}H_{24}O_4Sn$	Catalysts

- Dibutyltin (DBT) Compounds**

English names	CAS No.	Chemical formulas	Main intended purposes
Diocetyl tin oxide	870-08-6	$C_{16}H_{34}OSn$	Ingredients of stabilizer, catalysts
Diocetyl tin dichloride; Stannane, dichlorodiocetyl-,	3542-36-7	$C_{16}H_{34}Cl_2Sn$	Intermediate of stabilizer

<i>Diocetyl tin maleate; 2,2-Dioctyl-1,3,2-dioxastannepin-4,7-dione</i>	16091-18-2	$C_{20}H_{36}O_4Sn$	<i>Stabilizers, antioxidants</i>
<i>Di(n-octyl)tin bis(sioctylthioglycolate); Diiocetyl 2,2'-[(dioctylstannylene)bis(thio)] diacetate</i>	26401-97-8	$C_{36}H_{72}O_4S_2Sn$	<i>Stabilizers, antioxidants</i>
<i>Diocetyl tin dilaurates (DOTL); Dioctylbis[(1-oxododecyl)oxy]stannane</i>	3648-18-8	$C_{40}H_{80}O_4Sn$	<i>Stabilizers, antioxidants</i>

- Asbestos**

<i>English names</i>	<i>CAS No.</i>	<i>Chemical formulas</i>	<i>Main intended purposes</i>
<i>Asbestos</i>	1332-21-4; 132207-32-0; 132207-33-1		<i>Insulators, fillers</i>
<i>Crocidolite</i>	12001-28-4	$Na_2Fe_5(Si_8O_{22})(OH)_2$	<i>Insulators, fillers</i>
<i>Chrysotile</i>	12001-29-5	$Mg_3Si_2O_5(OH)_4$	<i>Insulators, fillers</i>
<i>Amosite</i>	12172-73-5	$(Mg, Fe)_7Si_8O_{22}(OH)_2$	<i>Insulators, fillers</i>
<i>Anthophyllite</i>	17068-78-9	$(Mg, Fe)_7Si_8O_{22}(OH)_2$	<i>Insulators, fillers</i>
<i>Tremolite</i>	14567-73-8	$Ca_2Mg_5Si_8O_{22}(OH)_2$	<i>Insulators, fillers</i>
<i>Actinolite</i>	13768-60-8	$Ca_2(Mg, Fe)_5Si_8O_{22}(OH)_2$	<i>Insulators, fillers</i>

- Formaldehyde**

<i>English names</i>	<i>CAS No.</i>	<i>Chemical formula</i>	<i>Main intended purposes</i>
<i>Formaldehyde; formalin; formic aldehyde; formol</i>	50-00-0	HCHO	<i>Preservatives, monomer (e.g. phenol resin and melamine resin)</i>

- Polyvinyl Chloride (PVC) and PVC blends**

<i>English names</i>	<i>CAS No.</i>	<i>Chemical formula</i>	<i>Main intended purposes</i>
<i>PVC and PVC blends; polyvinylchloride and polyivinychloride blends</i>	e.g. 9002-86-2	$-(CH_2CHCl)_n-$	<i>Vinyl chloride resin</i>

- Beryllium oxide**

English names	CAS No.	Chemical formula	Main intended purposes
Beryllium oxide	e.g. 1304-56-9	BeO	Heat sink

- Hydrofluorocarbon (HFC) , Perfluorocarbon (PFC)**

English names	CAS No.	Chemical formulas	Main intended purposes
HFC-23; Trifluoromethane	75-46-7	CHF ₃	Refrigerant
HFC-32; Difluoromethane	75-10-5	CH ₂ F ₂	Refrigerant
HFC-41; Fluoromethane; Methyl Fluoride	593-53-3	CH ₃ F	Refrigerant
HFC-125; Pentafluoroethane	354-33-6	C ₂ HF ₅	Refrigerant
HFC-134; 1,1,2,2-tetrafluoroethane	359-35-3	CHF ₂ CHF ₂	Refrigerant
HFC-134a; 1,1,1,2-tetrafluoroethane	811-97-2	CH ₂ FCF ₃	Refrigerant
HFC-143; 1,1,2-trifluoroethane	430-66-0	CHF ₂ CH ₂ F	Refrigerant
HFC-143a; 1,1,1-trifluoroethane	420-46-2	CH ₃ CF ₃	Refrigerant
HFC-152a; 1,1-difluoroethane	75-37-6	CH ₃ CHF ₂	Refrigerant
HFC-227ea; 1,1,1,2,3,3,3-heptafluoropropane	431-89-0	C ₃ HF ₇	Extinguishing agent
HFC-236fa; 1,1,1,3,3,3-hexafluoropropane	690-39-1	C ₃ H ₂ F ₆	Extinguishing agent
HFC-245ca; 1,1,2,2,3-pentafluoropropane	679-86-7	C ₃ H ₃ F ₅	Refrigerant
HFC-43-10mee; 1,1,1,2,3,4,4,5,5,5-decafluoropentane; 2H,3H-decafluoropentane	138495-42-8	C ₅ H ₂ F ₁₀	Solvent
HFC-236cb; 1,1,1,2,2,3-Hexafluoropropane	677-56-5	C ₃ H ₂ F ₆	Refrigerant
HFC-236ea; 1,1,1,2,3,3-Hexafluoropropane	431-63-0	C ₃ H ₂ F ₆	Refrigerant
HFC-245fa; 1,1,1,3,3-pentafluoropropane	460-73-1	C ₃ H ₃ F ₅	Foaming agent
HFC-365mfc; 1,1,1,3,3-pentafluorobutane	406-58-6	C ₄ H ₅ F ₅	Foaming agent, cleaning agent
PFC-14; Perfluoromethane; Tetrafluoromethane; Carbon tetrafluoride	75-73-0	CF ₄	Dry etching
PFC-116; Perfluoroethane; Hexafluoroethane	76-16-4	C ₂ F ₆	Refrigerant

PFC-218; Perfluoropropane; Octafluoropropane	76-19-7	C ₃ F ₈	Refrigerant
PFC-31-10; Perfluorobutane; Decafluorobutane	355-25-9	C ₄ F ₁₀	Extinguishing agent
PFC-c318; Perfluorocyclobutane; Octafluorocyclobutane	115-25-3	c-C ₄ F ₈	Dry etching
PFC-41-12; Perfluoropentane; Dodecafluoropentane	678-26-2	C ₅ F ₁₂	Solvent
PFC-51-14; Perfluorohexane; Tetradecafluorohexane	355-42-0	C ₆ F ₁₄	Refrigerant

- Perfluorooctane sulfonates (PFOS)**

English names	CAS No.	Chemical formula	Main intended purposes
PFOS; Perfluorooctane sulfonates	e.g. 2795-39-3	C ₈ F ₁₇ SO ₂ X (X = hydroxyl, metallic salt, halide, amide, and other derivatives, including polymers)	Water repellent agent, oil repellent agent

- Specific benzotriazole**

Example:

English names	CAS No.	Chemical formula	Main intended purposes
2-(3',5'-Di-tert-butyl-2'-hydroxyphenyl)benzotriazole; 2-(2'-Hydrox-3',5'-di-tert-butylphenyl)benzotriazole	3846-71-7	C ₂₀ H ₂₅ N ₃ O	Ultraviolet protectants, ultraviolet absorbers

- Perchlorates**

Example:

English names	CAS No.	Chemical formula	Main intended purposes
Lithium perchlorate	7791-03-9	LiClO ₄	Antistatic agent, lithium battery
Sodium perchlorate	7601-89-0	NaClO ₄	Antistatic agent, lithium battery
Sodium perchlorate monohydrate	7791-07-3	NaClO ₄ ·H ₂ O	Antistatic agent, lithium battery

Potassium perchlorate	7778-74-7	KClO ₄	Antistatic agent, lithium battery
Ammonium perchlorate	7790-98-9	NH ₄ ClO ₄	Antistatic agent, lithium battery
Magnesium perchlorate	10034-81-8	Mg(ClO ₄) ₂	Antistatic agent, lithium battery

Disclaimer: Application laws and regulations, and controlled substances in Appendixes 1 and 2 are illustrative only, not all the substances and its alias names are listed.