

1.0 PURPOSE

This document describes Microsemi Analog Mixed Signal Group's (MSC-AMSG) Controlled Substances policy and procedures with respect to banned and restricted substances. The requirements define two categories of materials:

- 1.1 Banned Materials
- 1.2 Restricted Materials

This specification is used to provide a complete listing of Banned and/or Restricted Substances to MSC-AMSG suppliers.

2.0 SCOPE

- 2.1 This policy applies to all business activities; including design, wafer fabrication, assembly, test, purchase, receiving, storage, packing and shipping activities.

3.0 RESPONSIBILITY AND AUTHORITY

- 3.1 The Director of Quality and Reliability is responsible in maintaining this procedure.

4.0 RELATED DOCUMENTS

- 4.1 SGE2109, Procurement Specification
- 4.2 SGE2231, Purchase Order Quality Requirements
- 4.3 SGQ1309, Approved Vendor List
- 4.4 SGQ1314, Purchase Order Review
- 4.5 SGQ1327, Supplier Requirement, Banned and Restricted Substances
- 4.6 SGA7203, Environmental Management System

5.0 REFERENCE DOCUMENTS

- 5.1 Montreal Protocol 1997 (ODS)
- 5.2 Restriction of Hazardous Substances Directive (RoHS)
- 5.3 EEC directives
- 5.4 Japanese Environmental Legislation
- 5.5 Joint Industry Guide, Material Composition Declaration Guide, EIA, EICTA JGPSSI
- 5.6 Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- 5.7 China RoHS

REV DCN DATE REV DCN DATE

CONTROL POLICY,
BANNED AND RESTRICTED SUBSTANCES

- 15913 06/04
A 18312 02/08
B 18712 06/09
C 19429 06/11

APPROVAL/DATE

ORIG.:

Q. A.:

OTHER:

DOC. CTR.:

4.0 DEFINITIONS

- 4.1 Banned Material – A material that has been determined to be environmentally un-friendly and is subject to either a legal ban or a company or industry prohibition.
- 4.2 CAS Number – A registry number assigned to a chemical or chemical compound by the Chemical Abstracts Services, Columbus, OH.
- 4.3 Intentionally Added – The manufacturer or purchaser knowingly or unknowingly uses a listed material during manufacture or incorporates a listed material into the product during manufacture.
- 4.4 Material – Refers to any of the listed substances, chemicals compounds, polymers or elements.
- 4.5 Material Subject to Disclosure – A material for that exceeds the Threshold Level.
- 4.6 Product – A product manufactured by MSC-AMSG or by a sub-contractor for MSC-AMSG.
- 4.7 Packing – Includes any box, container, reel, tray tube wrapper, cushioning, tape, inks or other material used to contain, store, and transport a product prior to its use by the purchaser.
- 4.8 Restricted Material – A material that has been designated as environmentally un-friendly and is not to be used if at all possible. The use of a restricted substance in any material requires notification.
- 4.9 Substances – Substances are chemical elements and their compounds. CAS numbers are provided for these substances where known.
- 4.10 Threshold Level – Concentration level, which defines the limit above which the presence of a substance or material in a product must be declared based on the requirements of this specification.
- 4.11 Impurity – 1) A substance contained in a natural material which cannot be removed in a refining process totally (natural impurity) and 2) A substance generated in a synthesis process, the total removal of which is technically impossible.

5.0 REQUIREMENTS

Banned or Restricted Materials Requiring Disclosure:

- 5.1 Banned Substances:
Substances listed as Banned shall not be added to materials or used in the manufacture products that exceed the Threshold Limit. Analytical test reports demonstrating compliance may be required.
- 5.2 Restricted Substances – For substances listed as Restricted, MSC-AMSG shall be notified when materials are either intentionally used or are present in materials or products that exceed the Threshold Limit.

6.0 NOTIFICATION REQUIREMENTS

- 6.1 Microsemi Analog Mixed Signal Group (MSC-AMSG) shall be notified by the supplier if any of the banned or restricted substances are used in materials or products supplied. The substance shall be identified and information regarding the specific application and

quantity by weight shall be forwarded to MSC-AMSG, attention to the Quality Assurance Manager.

7.0 BANNED OR RESTRICTED SUBSTANCES LISTING

The following Tables are attached to this Specification:

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| 7.1 | Table I | Banned Substance Summary Listing |
| 7.2 | Table II | Comprehensive Listing of Substances that are Banned and/or Restricted by Microsemi Analog Mixed Signal Group |

TABLE I SUMMARY

SUBSTANCE	CAS	Category	THRESHOLD LEVEL (% by Weight)	COMMON USAGES
Heavy Metals				
Lead and Lead Compounds	7439-92-1	Banned	1000 ppm or Intentionally Added (Note 1)	Solder, Paint , Catalyst
Cadmium and Cadmium Compounds	7440-43-9	Banned	75 ppm or Intentionally Added	Finish on PCB, Relay contacts, NiCd Batteries
Mercury and Mercury Compounds	7439-97-6	Banned	1000 ppm or Intentionally Added	Fluorescent bulb, High efficiency phosphor
Hexavalent Chromium Compounds	18540-29-9	Banned	1000 ppm or Intentionally Added	Anti-corrosion surface treatment
Clorinated Organic Compounds				
Polychlorinated biphenyls (PCB)	1336-36-3	Banned	Cannot be Intentionally Added	Solvent, Electrolytic solution,
Polychlorinated naphthalenes (PCN)	70776-03-3	Banned	Cannot be Intentionally Added	Flame Retardant, Lubricant, Paint
Clorinated Paraffins (CP)	10871-26-2	Banned	Cannot be Intentionally Added	Plasticizer for PVC, Lubricant, Flame retardant
Polychlorinated Terphenyls (PCTs)	26140-60-3	Banned	Cannot be Intentionally Added	
Mirex (Perchlordecone)	2385-85-5	Banned	Cannot be Intentionally Added	Pesticides, Fungicides, Flame retardants in resins
Brominated Organic Compounds				
Poly brominated Biphenyls (PBBs)	Various	Banned	1000 ppm or Intentionally Added	Flame Retardants contained in plastics
Polybrominated byphenyl ethers (PBBEs)	Various	Banned	1000 ppm or Intentionally Added	Flame Retardants contained in plastics
Polybrominated diphenylethers (PBDE) and Oxides (PBBO)	Various	Banned	1000 ppm or Intentionally Added	Flame Retardants contained in plastics
Tererabromobisphenol A (TBBA)	Various	Banned	1000 ppm or Intentionally Added	Flame Retardants used in PCB resins
Organophosphous Compounds	Various	Banned	1000 ppm or Intentionally Added	Flame Retardant in thermoplastics
Perfluorooctane Sulfate (PFOS)	1763-23-1	Banned	1000 ppm or Intentionally Added	Scotchgard
Perfluorooctanic Acid (PFOA)	335-67-1	Banned	1000 ppm or Intentionally Added	Teflon
Organic Tin Compounds				

TABLE I (Con't)

SUBSTANCE	CAS	Category	THRESHOLD LEVEL (% by Weight)	COMMON USAGES
Tributyl tin compounds	1461-23-0	Banned	Cannot be Intentionally Added	Stabilizer, Anti-oxidant, Anti-fungal
Triphenyl tin compounds	668-34-8	Banned	Cannot be Intentionally Added	Stabilizer, Anti-oxidant, Anti-fungal
Asbestos and Asbestos materials	1335-21-4	Banned	Cannot be Intentionally Added	Insulator, Filler, Abrasive
Azo Compounds	Various	Banned	Cannot be Intentionally Added	Pigment, Dyes, Colorant
Formaldehyde	50-00-0	Banned	1000 ppm Maximum	Preservatives
Ozone depleting Substances				
Chloroflourocarbons (CFCs)	Various	Banned	Cannot be Intentionally Added	Refrigerants, Foaming agent, Solvent cleaner
Hydrochlorofluorocarbons (HCFCs)	Various	Restricted	1000 ppm or Intentionally Added	Refrigerants, Foaming agent, Solvent cleaner
Halons	Various	Banned	Cannot be Intentionally Added	Refrigerants, Foaming agent, Solvent cleaner
Radioactive Materials	Various	Restricted	Cannot be Intentionally Added	Detectors
Polivinyllchloride Polymer (PVC)	9022-86-2	Restricted	1000 ppm Maximum	Insulation, Heat resistance
Phthalates	Various	Restricted	1000 ppm Maximum	Plasticizer, Dye, Lubricants, Paint
Residual Monomers	Various	Restricted	1000 ppm Maximum	Propellant in aerosol, Adhesives
Benzene	71-43-2	Restricted	1000 ppm Maximum	Solvents, Lacquers, Varnish
Antimony (metallic)	7440-36-0			
Antimony Trioxide	1309-64-4	Restricted	1000 ppm Maximum	Flame Retardant in plastic, Pb-free solder
Antimony Pentoxide	1314-60-9	Restricted	1000 ppm Maximum	Flame Retardant in plastic, Pb-free solder
Arsenic Compounds	7440-38-2	Restricted	1000 ppm Maximum (Note 2)	Dopent in GaAs technology
Beryllium	7440-41-7	Restricted	1000 ppm Maximum	Ceramics, Heat spreader, insulator

Note 1: Excludes the use of lead (Pb) in solder, electrical components and interconnect materials. Notification is required.

Pb limits for the following alloys that contain Pb as an additive:

Alloy	Allowable content of Pb
Steel	Less than 0.35 wt%
Aluminum Alloy	Less than .04 wt%
Copper Alloy	Less than 4 wt%
Solder	Less than 1000 ppm

Note 2: Banned except for doping in GaAs, which requires notification

TABLE II BANNED AND RESTRICTED SUBSTANCES

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
HEAVY METALS			
Cadmium			
Cadmium, Metal	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, stabilizers used for 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 • H 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
Cadmium Carbonate	513-78-0		
Cadmium Fluoroborate	14486-19-2		
Lead			
Lead, Metal	7439-92-1	Pb	
Lead/Tin alloy	29412-44-7	Pb-Sn	Solder, brazing materials and electrical connection
Lead (II) Oxide	1317-36-8	PbO	Pigments, rubber vulcanization, accelerators and solid lubricants
Lead (IV) Oxide	1309-60-0	PbO ₂	Lead-acid batteries, glass and paints
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

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Lead (II) Chloride	7758-95-4	PbCl ₂	
Lead (IV) Chloride	13463-30-4	PbCl ₄	
Lead (II) Iodide	10101-63-0	PbI ₂	Bronze, printing, photographs
Lead (II) Sulfide	1314-87-0	PbS	Infrared ray detectors
Lead (II) Canide	592-05-2	Pb(CN) ₂	Antirust pigments
Lead fluoroborate	13814-96-5	Pb(BF ₄) ₂	Plating baths, anticorrosive surface treatment
Lead Fluorosilicate	25808-74-6	PbSiF ₆	Plating baths, lead refinement
Lead Nitrate	10099-74-8	Pb(NO ₃) ₂	Optical Glass
Lead Carbonate	598-63-0	PbCP ₃	
Lead Hydroxycarbonate	1344-36-1	(PbCO ₃)(OH) ₂	
Lead Perchlorate	13637-76-8	Pb(ClO ₄) ₂	
Lead (II) sulfate	7446-14-2; 15739-80-7	PbSO ₄	Pigments, rubber compound ingredients, vinyl chloride stabilizers, batteries.
Lead oxide sulfate	12202-17-4	Pb ₄ SO ₇	Pigments
Lead (II) phosphate	7446-27-2	Pb ₃ (PO ₄) ₂	Stabilizers for plastics
Lead thiocyanate	592-87-0	Pb(SCN) ₂	Stain, matches
Lead (II) Acetate, Trihydrate	6080-56-4	Pb(CH ₃ COO) ₂ *3H ₂ O	
Lead (II) Acetate, Trihydrate	301-04-2	Pb(CH ₃ COO) ₂	
Lead (IV) Acetate	546-67-8	Pb(CH ₃ COO) ₄	
Lead Oleate	1120-46-2	Pb[CH ₃ (ch ₂) ₇ CH=Ch(CH ₂) ₇ CO O] ₂	Lubricants, curing agents
Lead Stearate	7428-48-0, 1072-35-1	Pb(C ₁₇ H ₃₅ COO) ₂	Lubricants, stabilizers for vinyl chloride
Lead Metaborate	10217-39-8	Pb(BO ₂) ₂ *J ₂ O	Desiccants for paints
Lead Metasilicate	11120-22-2; 22569-74-0	PbSiO ₃	Desiccants for paints
Lead Antimonite	122666-38-5; 13510-89-9	Pb ₃ (SbO ₄) ₂	Pigments, coloring agents for glass
Lead Arsenate (1:1)	7784-40-9	PbHAsO ₄	
Lead (II) Arsenite	10031-13-7	Pb(AsO ₂) ₂	Pesticides
Lead Chromate	1344-37-2	PbCrO ₄	Pigments, paints, ink
Lead Molybdate	10190-55-3	PbMoO ₄	Pigments
Calcium Plumbate	12013-69-3	Ca ₂ PbO ₄	Oxidizers
Tetramethyl Lead	75-74-1	Pb(CH ₃) ₄	
Tetraethyl Lead	78-00-2	Pb(C ₂ H ₅) ₄	
Lead Selenide	12069-00-0		
Lead(II) Titanate	12060-00-3		
Lead Hydrocarbonate	1319-46-6		
Lead (II) Chromate	7758-97-6		

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Mercury			
Mercury Metal	7439-97-6	Hg	Electrodes, mercury lamps
Mercury (I) Oxide	15829-52-5	Hg ₂ O	
Mercury (II) Oxide	21908-53-2	HgO	Mercury cell, preservatives
Mercury (I) Chloride	10112-91-1	Hg ₂ Cl ₂	Electrodes, pigments
Mercury (II) Chloride, Mercury Bi-chloride	33631-63-9 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 sulfide	1344-48-5		
Mercury (II) Fulminate	628-86-4	Hg(ONC) ₂	
Mercury (II) Acetate	1600-27-7	Hg(CH ₃ COO) ₂	
Methylmercury Salts	22967-92-6	C ₂ H ₅ HgX X=Cl, Br, I, OH, etc	Fungicides
Ethylmercury Salts			Preservative, disinfectants
Propylmercury Salts		C ₃ H ₇ HgX X=Cl, Br, I, OH, etc.	
Phenyl mercury Salts		C ₆ H ₅ HgX X=Cl, Br, I, OH, etc.	Preservative, disinfectants
Methoxyethylmercury Salts		CH ₃ O 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	
Chromium			
Chromium Metal	7440-47-3		
Chromium (VI) Oxide; Chromium trioxide	1333-82-0	CrO ₃	Pigments, catalysts plating, 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(CrOCl)	
Ammonium Chromate	7788-98-9	(NH ₄) ₂ CrO ₄	Photographs, catalysts
Copper Chromate	13548-42-0	CuCrO ₄	
Magnesium Chromate	13423-61-5	MgCrO ₄	Antirust, surface treatment
Calcium Chromate	13765-19-0	CaCrO ₄	Pigments, inks and tanning

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Strontium Chromate	7789-06-2	SrCrO4	Pigments, antirust
Barium Chromate	10294-40-3	BaCrO4	Pigments, Corrosion prevention, coloring agents
Lead Chromate; Chrome yellow	1344-37-2, 7758-97-6	PbCrO4	Pigments, paints and inks
Zinc Chromate	12018-19-8; 13530-65-9; 25029-95-2	ZnCrO4	Pigments, Anti-corrosives
Sodium Dichromate; Sodium Chromate	10588-01-9 7775-11-3	Na2Cr2O7	Pigments, photographs, tanning corrosion prevention
Potassium dichromate; Potassium bichromate	7778-50-9 7789-09-5	K2Cr2O7	Pigments, photographs, batteries, plating, tanning
Ammonium dichromate; Ammonium bichromate	7789-09-6	(NH4)2Cr2O7	Pigments, photographs, catalysts
Calcium dichromate; Calcium bichromate	7789-09-7	CACr2O7	Catalysts, corrosion prevention
Zinc dichromate; Zinc bichromate	14018-954-2	ZnCr2O4	Pigments
Chromic Acetate	1066-30-4		
CHLORINATED ORGANIC COMPOUNDS			
PCB; polychlorinated biphenyls	1336-36-3	C12H10-xClx (x=1-10)	Lubricants, Oils
Aroclor	12767-79-2		
Chlorodiphenyl (1260)	11096-82-5		
Kanechlor 500	27323-18-8		
Aroclor 1254	11097-69-1		
Terphenyls	26140-60-3		
Polychlorinated Naphthalenes	70776-03-3	C10H8-xClx (x>3)	Lubricants, paints, preservatives
Trichloronaphthalenes	1321-65-9	C10H5Cl3	
Tetrachloronaphthalenes	1335-88-2	C10H4Cl4	
Pentachloronaphthalenes	1321-64-8	CH3Cl5	
Ocatchloronaphthalenes	2234-13-1	C10Cl8	
Short-Chain Chlorinated Paraffins	10871-26-2, 60788-76-9 6244--39-, 85422-92-0, 97552-43-0, 85535-84-8, 855355-85-9, 85535-86-0, 8929-39-8		Plasticizers flame retardants

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Mirex (Perchlordecone); Dodecachlorooctahydro-1,3, 4-metheno-2H-cycrobuta (cd) pentalene	2385-85-5	C ₁₀ Cl ₁₂	Pesticides, fungicides, flame retardants
1,1,1,2 Tetrachloroethane	630-20-6	C ₂ H ₂ Cl ₄	Solvents, Cleaning, de-greasing, fumigants, dyes Fire extinguishers
1,1,2,2 Tetrachloroethane	79-34-5	CHCl ₂ CHCl ₂	
1,1 Dichloroethane (vinylidene chloride)	75-35-4	C ₂ H ₂ Cl ₂	Allowed in Front-end processes only
Pentachloroethane	76-01-8	C ₂ H ₂ Cl ₂	
Tetrachloromethane (Carbon Tetrachloride)	56-23-5	CCl ₄	
1,1,1 Trichloroethane	71-55-6		
1,1,2 or 1,2,2 Trichloroethane	79-00-5	C ₂ H ₃ Cl ₃	
1,2 Dichloroethane (Ethylene Dichloride)	107-06-2	CH ₂ ClCH ₂ Cl	
3,3 Dichlorobenzidine	91-94-1		
Dichloromethane (Methylene Chloride)	75-09-2		
Methyl Chloromethyl Ether (Chloromethyl Methyl Ether)	107-30-2	C ₂ H ₅ ClO	
Tetrachloroethylene (Perchloroethylene)	127-18-4	CCl ₂ CCl ₂	
Trichloroethylene (TCE)	79-01-6	CHClCCl ₂	
Trichloromethane (Chloroform)	67-66-3	CHCl ₃	
N,N-Bis(2-chloroethyl)-2- Naphthylamine	494-03-1		
Bis(chloromethyl) ether	542-88-1		
2-Ethoxyethanol	110-80-5		
2-Ethoxyethyl acetate	111-15-9		
2-Methoxyethanol	109-86-4		
2-Methoxyethyl acetate	110-49-6		
Diethylene glycol dimethyl ether	111-96-6		
Diethylene glycol monomethyl ether	111-77-3		
Triethylene glycol dimethyl ether	112-49-2		
Fluoronated Compounds			
Perfluorooctane Sulfate	1763-23-1	PFOS	Scotchgard
Perfluorooctanic Acid	335-67-1	PFOA	Teflon

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
BROMINATED ORGANIC COMPOUNDS			
Polybrominated Biphenyls (PBB)	58536-65-1, 67774-32-7, 13654-09-6, 37313-41-2, 61288-12-9, 27858-07-7, 63936-56-1, 36355-01-8, 59080-40-9, 68928-80-3, 2050-47-7, 92-86-4, 2052-07-5, 2113-57-7, 92-66-0, 101-55-3, 59536-65-1		Flame Retardant
Polybromodiphenyl ether; Polybromodiphenyloxyde; Polybrominated phenyl ethers; PBDE; PBDO; PBBE		C ₁₂ H ₁₀ -xBR _x O (x=1-10)	Flame Retardant
Decabromodiphenyl ether; Decabromodiphenyloxyde; DBDPE; DBDPO	13654-09-6 1163-19-5	C ₁₂ H ₂ Br ₁₀ O	Flame retardant (for PE, ABS, and polyester)
Octabromodiphenyl ether; Octabromodiphenyloxyde	61288-13-9 32536-52-0	C ₁₂ H ₂ Br ₈ O	Flame retardant (for ABS, HIPS and LDPE)
Hexabromodiphenyl ether; Hexabromodiphenyloxyde	36483-60-0	C ₁₂ H ₄ Br ₆ O	Flame Retardant
Heptabromobiphenyl ether	68928-80-3		
Nanobromobiphenyl ether	63936-59-1		
Pentabromodiphenylether; Pentabromodiphenyloxyde	32354-81-9	C ₁₂ H ₅ Br ₅ O	Flame Retardant
Tetrabromobiphenyl + ether	40088-45-7 40088-47-9		
Tetrabromobisphenol-A-bis TBBP-A-BIS (FR-720)	21850-44-2	C ₂₁ H ₁₀ Br ₈ O ₂	Flame Retardant
Monomethyldibromo Diphenylmethane DBBT	99788-47-8		Residues during the manufacture of polymers
Monomethyldichloro Diphenylmethane	81161-70-8		Residues during the manufacture of polymers
Monomethyltetrachloro Diphenylmethane	76253-60-6		Residues during the manufacture of polymers
Dibromobiphenyl and Ethers	92-86-4 2050-47-7		
PBT's Poly brominated terphenyls	Various		Additive in plastics and textiles

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Tris (2,3-dibromopropyl) Phosphate (TRIS) (TRIS-BP)	126-72-7		Flame Retardant
Tribromobiphenyl ether	49690-94-0		
Bromobiphenyl + ethers	2052-07-5 101-55-3		
Red Phosphorous	7723-14-0		Flame retardant in plastic
Aliphatic/alicyclic brominated compounds, (FR14)			Flame retardant in plastic
Aliphatic/alicyclic brominated compounds w/Antimony (FR15)			Flame retardant in plastic
Aromatic brominated compounds (FR16)			Flame retardant in plastic
Aromatic brominated compounds (FR17)			Flame retardant in plastic
Aliphatic/alicyclic chlorinated and brominated compounds (FR22)			Flame retardant in plastic
Brominated organic phosphorus compounds (FR42)			Flame retardant in plastic
Poly (2,6-dibromo-phenylene oxide)	69882-11-7		Flame retardant in plastic
Tetra-decabromo-diphenoxy-benzene	58965-66-5		Flame retardant in plastic
1,2-Bis (2,4,6-tribromo-phenoxy) ethane	37853-59-1		Flame retardant in plastic
3,5,3',5'-Tetrabromo-bisphenol A (TBBA)	79-94-7		Flame retardant in plastic
TBBA, unspecified	30496-13-0		Flame retardant in plastic
TBBA-epichlorhydrin oligomer	40039-93-8		Flame retardant in plastic
TBBA-diglycidyl-ether oligomer	70682-74-5		Flame retardant in plastic
TBBA carbonate oligomer	28906-13-0		Flame retardant in plastic
TBBA carbonate oligomer phenyloxy end capped	94334-64-2		Flame retardant in plastic
TBBA carbonate oligomer 2,4,6-tribromo-phenol term	71342-77-3		Flame retardant in plastic
TBBA-bisphenol A-phosgene polymer	32844-27-2		Flame retardant in plastic

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Brominated epoxy resin end-capped with tribromophenol	139638-58-7, 135229-48-0		Flame retardant in plastic
TBBA bis-(2-hydroxy-ethyl-ether)	4162-45-2		Flame retardant in plastic
TBBA-dimethyl-ether	37853-61-5		Flame retardant in plastic
Tetrabromo-bisphenol S	39635-79-5		Flame retardant in plastic
TBBA-bis-(2,3-dibromo-propyl-ether)	42757-55-1		Flame retardant in plastic
2,4-Dibromo-phenol	615-58-7		Flame retardant in plastic
2,4,6-tribromo-phenol	118-79-6		Flame retardant in plastic
Pentabromophenol	608-71-9		Flame retardant in plastic
2,4,6-tribromo-phenyl-allyl-ether	3278-89-5		Flame retardant in plastic
Tribromo-phenyl-allyl-ether, unspecified	26762-91-4		Flame retardant in plastic
Bis (methyl) tetrabromo-phthalate	55481-60-2		Flame retardant in plastic
Bis (2-ethylhexyl) tetrabromo-phthalate	26040-51-7		Flame retardant in plastic
2-Hydroxy-propyl-2(2-hydroxy-ethoxy)-ethyl-TBP	20566-35-2		Flame retardant in plastic
TBPA, glycol and propylene-oxide esters	75790-69-1		Flame retardant in plastic
N,N'-Ethylene-bis-(tetrabromo-phthalimide)	32588-76-4		Flame retardant in plastic
Ethylene-bis 85, 6-dibromo -norbornene-2,3-dicarboximide)	52907-07-0		Flame retardant in plastic
2,3-Dibromo-2-butene-1,4-diol	487270		Flame retardant in plastic
Dibromo-neopentyl-glycol	3296-90-0		Flame retardant in plastic
Dibromo-propanol	95-13-9		Flame retardant in plastic
Tribromo-neopentyl-alcohol	36483-57-8		Flame retardant in plastic
Poly tribromo-styrene	57137-10-7		Flame retardant in plastic
Tribromo-styrene	61368-34-1		Flame retardant in plastic
Bibromo-styrene grafted PP	171091-06-8		Flame retardant in plastic
Poly-dibromo-styrene	31780-26-4		Flame retardant in

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
			plastic
Bromo-Chloro-paraffins	68955-41-9		Flame retardant in plastic
Bromo-Chloro-alpha-olefin	82600-56-4		Flame retardant in plastic
Vinylbromide	593-60-2		Flame retardant in plastic
Tris-(2,3-dibromo-propyl)-isocyanurate	52434-90-9		Flame retardant in plastic
Tris (2,4-dibromo-phenyl) phosphate	49690-63-3		Flame retardant in plastic
Tris (tribromo-neopentyl) phosphate	19186-97-1		Flame retardant in plastic
Chlorinated and brominated phosphate ester	125997-20-8		Flame retardant in plastic
Pentabromo toluene	87-83-2		Flame retardant in plastic
Pentabromo-benzyl bromide	38521-51-6		Flame retardant in plastic
1,3 Butadiene homopolymer, brominated	68441-46-3		Flame retardant in plastic
Pentabromo-benzyl-acrlate, monomer	59447-55-1		Flame retardant in plastic
Pentabromo-benzyl-acrlate, polymer	59447-57-3		Flame retardant in plastic
Decabromo-diphenyl-ethane	61262-53-1		Flame retardant in plastic
Tribromo-bisphenyl-maleinimide	59789-51-4		Flame retardant in plastic
Brominated trimethylphenyl-lindane			Flame retardant in plastic
Hexabromo-chyclo-dodecane (HBCD),	3194-55-6		Flame retardant in plastic
Tetrabromo-chyclo-octane	31454-48-5		Flame retardant in plastic
1,2-Dibromo-4-(1,2 dibromo-methyl)-cyclo-hexane	3322-93-8		Flame retardant in plastic
NBPA Na salt	25357-79-3		Flame retardant in plastic
Tetrabromo phthalic-anhydride	632-79-1		Flame retardant in plastic
ORGANOPHOSPHOROUS COMPOUNDS			Flame retardant in plastic
Triaryl Phosphates	Various		Flame retardant in plastic

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Trimethyl Phosphates	512-56-1		Flame retardant in plastic
Triphenyl Phosphates	115-86-6		Flame retardant in plastic
Bisphenol A diphenylphosphate	Various		Flame retardant in plastic
Resorcinol Diphosphate	57583-54-7		Flame retardant in plastic
Aluminum hydrate	21645-51-2		Flame retardant in plastic
Zinc borate	1332-07-6		Flame retardant in plastic
Melamine	108-78-1		Flame retardant in plastic
Talc	14807-96-6		Flame retardant in plastic
ORGANIC TIN COMPOUNDS			
Tributyl tin bromide	1461-23-0	(C ₄ H ₉) ₃ SnBr	Disinfectants, Paints
Bis (tributyl tin) oxide	56-35-9	C ₂₄ H ₅₄ O ₂ Sn ₂	Disinfectants, Paints
Triphenyl tin	668-34-8	(C ₆ H ₅) ₃ Sn	Disinfectants, Paints
Triphenyl tin bromide		(C ₆ H ₅) ₃ SnBr	Disinfectants, Paints
Triphenyl tin chloride	639-58-7	(C ₆ H ₅) ₃ SnCl	Disinfectants, Paints
Triphenyl tin hydroxide	76-87-9	(C ₆ H ₅) ₃ SnOH	Disinfectants, Paints
Triphenyl tin N, N'-dimethyldithiocarbamate	1803-12-9	(C ₆ H ₅) ₃ Sn(CH ₃) ₃ NCS ₂	
Triphenyl tin fluoride (fentin fluoride)	379-52-2	(C ₆ H ₅) ₃ SnF	
Triphenyl tin Acetate (fentin Acetate)	379-52-2	(C ₆ H ₅) ₃ SnOCOCH ₃	
Triphenyl tin fatty acid salts	18380-71-7		
Triphenyl tin chloroacetate	7094-94-2	(C ₆ H ₅) ₃ SnOCOCH ₂ Cl	
Triphenyl tin methacrylate	2155-70-6	C(C ₄ H ₉) ₃ SnC ₄ H ₅ O ₂	
Bis (tributyl tin) fumarate	6454-35-9	C ₂ H ₂ (COO) ₂ [(C ₄ H ₉) ₃ Sn] ₂	
Tributyl tin fluoride	1983-10-4	(C ₄ H ₉) ₃ SnF	
Bis (tributyl tin) 2, 3-dibromosuccinate	31732-73-5	[(C ₄ H ₉) ₃ Sn] ₂ C ₂ H ₂ (Br) ₂ (COO) ₂	
Tributyl tin acetate	56-36-0	(C ₄ H ₉) ₃ SnOCOCH ₃	
Tributyl tin laurate	3090-36-6	(C ₄ H ₉) ₃ SnC ₁₂ H ₂₃ O ₂	
Bis (tributyl tin) phthalate	4782-29-0	(C ₆ H ₄)(COO) ₂ [(C ₄ H ₉) ₃ Sn] ₂	
Tributyl tin sulfamate	6517-25-5	(C ₄ H ₉) ₃ SnSO ₃ NH ₂	
Bis (tributyl tin) maleate	14275-57-1	C ₂₈ H ₅₆ O ₄ Sn ₂	
Tributyl tin chloride	1461-22-9	(C ₄ H ₉) ₃ SnCl	

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Mixture of tributyl tin Cyclopentanecarboxylate and its analogs (Tributyl tin naphthenate)	85409-17-2		
Mixture of tributyl tin 1, 2, 3, 4, 4a, 4b, 5, 6, 10, 10a- decahydro-7-isopropyl-1, 4a- dimethyl-1 phenanthrenecarboxylate and its analogs (tributyl tin rosin salts)	26239-64-5	C32H56O2Sn	
Copolymer of alkyl acrylate, Methyl Methacrylate and Tributyl tin methacrylate (alkyl; C=8)			
ASBESTOS			
Asbestos	1332-21-4; 132207- 32-0; 132207-33-1		
Crocidolite	12001-28-4	Na ₂ Fe ₅ (Si ₈ O ₂₂)(OH) ₂	Insulators, fillers, etc.
Chrysotile	12001-29-5	Mg ₃ Si ₂ O ₅ (OH) ₄	Insulators, fillers, etc.
Amosite	12172-73-5	(Mg, Fe) ₇ Si ₈ O ₂₂ (OH) ₂	Insulators, fillers, etc.
Anthophyllite	17068-78-9	(Mg, Fe) ₇ Si ₈ O ₂₂ (OH) ₂	Insulators, fillers, etc.
Tremolite	14567-73-8	Ca ₂ Mg ₅ Si ₈ O ₂₂ (OH) ₂	Insulators, fillers, etc.
Actinolite	13768-60-8	Ca ₂ (Mg, Fe) ₅ Si ₈ O ₂₂ (OH) ₂	Insulators, fillers, etc.
AZO COMPOUNDS			
List of the amines that must not be produced when Azo compound are decomposed.			
4-Aminodiphenyl	92-67-1		Amines can be found in lubricants rubbers, plastics.
Benzidine	92-87-5		
4-chloro-o-toluidine	95-69-2		
2-naphthylamine	91-59-8		
o-aminoazotoluene	97-56-3		
2-amino-4-mitrotoluene	99-55-8		
p-chloroaniline	106-47-8		
2,4-diaminoanisoie	615-05-4		
4,4 diaminodiphenylmethane	101-77-9		
3,3 dichlorobenzidine	91-94-1		
3,3-dimethoxybenzidine	119-90-4		
3,3-dimethylbenzidine	119-93-7		

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
3,3-dimethyl-4,4-diaminodiphenylmethane	838-88-0		
p-cresidine	120-71-8		
4,4-methylene=bis-(2-chloroaniline)	101-14-4		
4,4-oxidianiline	101-80-4		
4,4-thiodianiline	139-65-1		
0-toluidine	95-53-4		
2,4-toluylenediamine	95-80-7		
2,4,5-trimethylamine	137-17-7		
4-aminoazobenzene	60-09-3		
o-anisidine	90-04-0		
PHTHALATES			
Di"isonyl" phthalate (DINP)	28553-12-0		
Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7		
Dibutyl phthalate (DBP)	84-74-2		
Bi-"isodecyl" phthalate (DIDP)	26761-40-0		
Bis (n-octyl) phthalate (DNOP)	117-84-0		
Butyl benzyl phthalate (BBP)	85-68-7		
FORMALDEHYDE			
Formaldehyde	50-00-0	HCHO	Preservatives, Monomer (e.g. phenol resin and melamine resin)
PVC and PVC blends	9002-86-2		Vinyl chloride resin
PVC and PVC blends, Polivinyllchloride and Polivinyllchloride blends.			
RESIDUAL MONOMERS			
1,3 Butadiene monomer	106-99-0		Residual Monomer
Butyl Acrylate	141-32-2		Adhesive
Acrylamide monomer	79-06-1		Residual Monomer
Acrylonitrile monomer	107-13-1		Residual Monomer
Epichlorhydrin monomer (chlorepoxypropane)	106-89-8, 25014-15-5, 25988-97-0		Residual Monomer

NAME	CAS No.	CHEMICAL FORMULA	MAIN PURPOSE
Styrene monomer	100-42-5		Solvent, residual monomer
Styrene Oxide	96-09-3		Softener, residual monomer
Vinyl Chloride monomer (polyvinyl chloride not included)	75-01-2-4		Residual Monomer, propellant in aerosol
Vinylidene chloride (1,1-Dichloroethylene) Monomer	75-35-4		Residual Monomer
BENZENE			
Benzene	71-43-2		Solvents, Lacquers, varnish, etc.
BERYLLIUM			
Beryllium	7440-41-7		Ceramics for Semiconductors
Beryllium-aluminum alloy	12770-50-2		
Beryllium chloride	7787-47-5		
Beryllium fluoride	7787-49-7		
Beryllium hydroxide	13327-32-7		
Beryllium oxide	1304-56-9		
Beryllium phosphate	13598-15-7		
Beryllium sulfate	13510-49-1		
Beryllium sulfate tetrahydrate	7787-56-6		
Beryl ore	4502-52-9		
ARSENIC			
Arsenic	7440-38-2		
Gallium arsenide	1303-00-0		Substrates for Semiconductors
Calcium arsenate	7778-44-1		
Calcium arsenite	27152-57-4		
Arsenic Pentoxide	1303-28-2		
Arsenic trioxide	1327-53-3		
Potassium arsenite	10124-50-2		
Potassium arsenate	7784-41-0		
Lead arsenate	3687-31-8		
RADIOACTIVE SUBSTANCES			
Uranium			
Plutonium			
Radon			
Americium			
Thorium			
Cesium	7440-46-2		
Strontium	7440-24-6		

OZONE DEPLETING SUBSTANCES (ODS)

Halons

Halons-Hydrobromofluorocarbons (as a group)
Halon 1211- Bromochlorodifluoromethane
Halon 1301 - Bromotrifluoromethane
Halon 2402 - Dibromotetrafluoroethane
Dibromodifluoromethane (Hydrobromofluorocarbon)
Methyl Bromide
2,3 Dibromopropyl phosphate
1,2 Dibromoethane

CFCs

Chlorofluorocarbons (CFC's as a group)
1,1,1,2 - Trichloro-2,2,-difluoroethane
1,1,1-Trichloro-2,2-trifluoroethane
1,1,1-Trifluorotrichloroethane
1,1-Dichloro-1,2,2,2-tetrafluoroethane
1,1-Dichloro-1,2,3,3,3-pentafluoropropane
Dichlorotetrafluoroethane
R11 Trichlorofluoromethane
R111 Pentachlorofluoromethane
R112 Tetrachlorodifluoroethane
R113 Trichlorothifluoroethane
R114 Dichlorotetrafluoroethane
R115 Chloropentafluoroethane
R12 Dichlorodifluoromethane
R13 Chlorotrifluoromethane
R211 Heptachlorofluoropropane
R212 Hexachlorodifluoropropane
R213 Pentachlorotrifluoropropane
R214 Tetrachlorotetrafluoropropane
R215 Trichloropentafluoropropane
R216 Dichlorohexfluoropropane
R127 Monochloroheptafluoropropane

HCFC's

HCFC-21 Dichlorofluoromethane
HCFC-22 Chlorodifluoromethane
HCFC-31 Chlorofluoromethane
HCFC-121 1,1,2,2-Tetrachloro-1-fluoroethane
HCFC-121a 1,1,1,2-Tetrachloro-2-fluoroethane
HCFC-122 1,2,2-Trichloro-1,1-difluoroethane
HCFC-122 1,2,2-Trichloro-1,1-difluoroethane
HCFC-122a 1,2,2-Trichloro-1,2 difluoroethane
HCFC-123 2,2-Dichloro-1,1,1-trifluoroethane
HCFC-124 2-Chloro-1,1,1,2-tetrafluoroethane
HCFC-124a1-Chloro-1,1,2,2-tetrafluoroethane

HCFC-131 1,1,2-Trichloro-2-fluoroethane
HCFC-131a 1,1,2-Trichloro-1-fluoroethane
HCFC-131b 1,1,1-Trichloro-2-fluoroethane
HCFC-132 1,2-Dichloro-1,2-difluoroethane
HCFC-132a 1,1-Dichloro-2,2-difluoroethane
HCFC-132b 1,2-Dichloro-1,1-difluoroethane
HCFC-133 1-Chloro-1,1,1-trifluoroethane
HCFC-133a 2-Chloro-1,1,1-trifluoroethane
HCFC-133b 1-Chloro-1,1,1-trifluoroethane
HCFC-141 1,2-Dichloro-1-fluoroethane
HCFC-141a 1,1-Dichloro-2-fluoroethane
HCFC-141b 1,1-Dichloro-1-fluoroethane
HCFC-142 2-Chloro-1,1-difluoroethane
HCFC-142a 1-Chloro-1,2-difluoroethane
HCFC-142b 1-Chloro-1,1-difluoroethane
HCFC-151 Chlorofluoroethane
HCFC-221 Hexachlorofluoropropane
HCFC-222 Pentachlorodifluoropropane
HCFC-223 Tetrachlorotrifluoropropane
HCFC-224 Trichlorotetrafluoropropane
HCFC-225 Dichloropentafluoropropane
HCFC-226 Chlorohexafluoropropane
HCFC-231 Pentachlorofluoropropane
HCFC-232 Tetrachlorodifluoropropane
HCFC-233 Trichlorotrifluoropropane
HCFC-234 Dichlorotetrafluoropropane
HCFC-235 Chloropentafluoropropane
HCFC-241 Tetrachlorofluoropropane
HCFC-242 Trichlorodifluoropropane
HCFC-243 Dichlorotrifluoropropane
HCFC-251 Trichlorofluoropropane
HCFC-252 Dichlorodifluoropropane
HCFC-253 Chlorotrifluoropropane
HCFC-261 Dichlorofluoropropane
HCFC-262 Chlorodifluoropropane
HCFC-271 Chlorofluoropropane
Chlorotetrafluoropropane

REACH LIST OF 46 SVHC SUBSTANCES				
	Substance name	CAS number	Description	Date of Implementation
1	4,4'-Diaminodiphenylmethane	101-77-9	C	10/28/2008
2	5-ter-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	vPvB	10/28/2008
3	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	PBT/vPvB	10/28/2008
4	Anthracene	120-12-7	PBT	10/28/2008
5	Benzyl butyl phthalate (BBP)	85-68-7	R	10/28/2008
6	Bis (2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	R	10/28/2008
7	Bis(tributyltin)oxide	56-35-9	PBT	10/28/2008
8	Cobalt dichloride	7646-79-9	C	10/28/2008
9	Diarsenic pentaoxide	1303-28-2	C	10/28/2008
10	Diarsenic trioxide	1327-53-3	C	10/28/2008
11	Dibutyl phthalate (DBP)	84-74-2	R	10/28/2008
12	Hexabromocyclododecane (HBCDD)	25637-99-4	PBT	10/28/2008
13	Lead hydrogen arsenate	7784-40-9	C, R	10/28/2008
14	Sodium dichromate, dihydrate	7789-12-0	R	10/28/2008
15	Triethyl arsenate	15606-95-8	C	10/28/2008
16	2,4-Dinitrotoluene	121-14-2	C	1/30/2010
17	Aluminosilicate Refractory Ceramic Fibres (RCF)	650-017-00-8	C	1/30/2010
18	Anthracene Oil	90640-80-5	C, PBT/vPvB	1/30/2010
19	Anthracene Oil, Anthracene Paste	90640-81-6	C, PBT/vPvB	1/30/2010
20	Anthracene Oil, Anthracene-low	90640-82-7	C, PBT/vPvB	1/30/2010
21	Anthracene Oil, Anthracene Paste, Anthracene Fraction	91995-15-2	C, PBT/vPvB	1/30/2010
22	Anthracene Oil, Anthracene Paste, Distr. Lights	91995-17-4	C, PBT/vPvB	1/30/2010
23	Coal Tar Pitch, high temperature	65996-93-2	C, PBT/vPvB	1/30/2010
24	Diisobutyl Phthalate	84-69-5	R	1/30/2010
25	Lead Chromate	7758-97-6	R	1/30/2010
26	Lead Chromate Molybdate Sulphate red (C.I. Pigment Red 104)	12656-85-8	C, R	1/30/2010
27	Lead Sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	C, R	1/30/2010
28	Tris (2-Chloroethyl) Phosphate	115-96-8	R	1/30/2010
29	Zirconia Aluminosilicate Refractory Ceramic Fibres (RCF)	650-017-00-9	C	1/30/2010
30	Acrylamide	79-06-1	CM	3/30/2010
31	Ammonium Dichromate	7789-09-5	CMR	6/18/2010
32	Boric Acid	10043-35-3	R	6/18/2010
33	Disodium Tetraborate, anhydrous	1303-96-4	R	6/18/2010
34	Potassium Chromate	7789-00-6	CM	6/18/2010
35	Potassium Dichromate	7778-50-9	CMR	6/18/2010
36	Sodium Chromate	7775-11-3	CMR	6/18/2010
37	Tetraboron Disodium heptaoxide, hydrate	12267-73-1	R	6/18/2010
38	Trichloroethylene	79-01-6	C	6/18/2010
39	2-Ethoxyethanol	109-86-4	R	12/15/2010
40	2-Methoxyethanol	109-86-4	R	12/15/2010

41	Chromic Acid	7738-94-5	C	12/15/2010
42	Chromium Trioxide	1333-82-0	CM	12/15/2010
43	Cobalt (II) carbonate	513-79-1	C,T	12/15/2010
44	Cobalt (II) Diacetate	71-48-7	C, T	12/15/2010
45	Cobalt (II) Dinitrate	10141-05-6	C, T	12/15/2010
46	Cobalt (II) Sulphate	10124-43-3	C, T	12/15/2010
	Dichromic Acid	13530-68-2	C	12/15/2010
	Oligimers of Chromic Acid and Dichromic Acid	---	C	12/15/2010