



# REACH SVHC CANDIDATE LIST

ECHA released the first candidate list of 15 SVHCs for authorization in Aug. 2008, the second SVHC candidate list in Jan. 2010, the third candidate list in June 2010, the fourth candidate list in December 2010, the fifth candidate list in June 2011, the sixth candidate list in December 2011, the seventh candidate list in June 2012, the eighth candidate list in December 2012, the ninth candidate list in June 2013, the tenth candidate list in December 2013, the eleventh candidate list in June 2014, the twelfth candidate list in December 2014, the thirteenth list in June 15, 2015 and the fourteenth list in December 2015, the fifteenth list in June 2016, the sixteenth list in January 2017, the seventeenth list in July 2017.

## ■ The Announcement of the First 15 SVHCs List

The European Chemical Agency (ECHA) has formally included 15 substances identified as Substances of Very High Concern (SVHC) in the candidate list of authorization on 28 October 2008.

The list of these 15 SVHC and possible applications are shown below:

Substance Name	CAS No.	EC No.	Possible Applications
4,4'-Diaminodiphenylmethane (MDA)	101-77-9	202-974-4	Curing agent for epoxy resin in PCB, preparation of PU, azo dyes in garments.
Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	Plasticizer for resin, PVC, acrylics.
Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7	204-211-0	Plasticizer for resin, PVC, blister
Dibutyl phthalate (DBP)	84-74-2	201-557-4	Plasticizer, in adhesives and paper coatings; insect repellent for textiles.
Anthracene	120-12-7	204-371-1	Source of dyestuff
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	Cosmetics and soap perfumes.
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	Leather coating, plasticizer in PVC and chlorinated rubber, flame retardant in plastic & textiles.
Cobalt Dichloride	7646-79-9	231-589-4	Moisture indicator in silica gel, absorbent.
Hexabromocyclododecane (HBCDD)	25637-99-4 3194-55-6 (134237-50-6) (134237-51-7) (134237-52-8)	247-148-4 and 221-695-9	Flame retardant used in HIPS and textiles.
Sodium dichromate	7789-12-0 10588-01-9	234-190-3	Chrome-tanning of leather, corrosion inhibitor in paints, mordant in textile dyein.
Bis(tributyltin) oxide (TBTO)	56-35-9	200-268-0	Pesticizer, fungicide in paint.



Diarsenic pentoxide	1303-28-2	215-116-9	Insecticides, weed killer, wood preservatives, coloured glass, dyeing and printing.
Diarsenic trioxide	1327-53-3	215-481-4	Weed killers, timber preservatives, manufacture of special glass.
Triethyl arsenate	15606-95-8	427-700-2	Intermediates for semi-conductor.
Lead hydrogen arsenate	7784-40-9	232-064-2	Insecticides.

■ **The Announcement of the Second 13 SVHCs List**

The European Chemical Agency (ECHA) officially published the second SVHC candidate list which includes a total of 29 substances on January 13th, 2010.

ECHA added the substance “Acrylamide” back to the candidate list on March 30th.

ECHA comprised a consolidation of the entries of aluminosilicate refractory ceramic fibres (Al-RCF) and zirconia aluminosilicate refractory ceramic fibres (ZrAl-RCF) included in the List in January 2010 and December 2011 on June 18th, 2012.

The list of these 13 SVHC and possible applications are shown below:

Substance Name	(CAS No.)	EC No.	Possible Applications
2,4-Dinitrotoluene	121-14-2	204-450-0	2,4-dinitrotoluene is used in the production of toluene diisocyanate, which is used for the manufacture of flexible polyurethane foams. The substance is also used as gelatinizing-plasticizing agent
Anthracene oil	90640-80-5	292-602-7	The substances are mainly used in the manufacture of other substances such as anthracene and carbon black. They may also be used as reducing agents in blast furnaces, as components in bunker fuel, for impregnating, sealing and corrosion protection.
Anthracene oil, anthracene paste, distn.lights	91995-17-4	295-278-5	
Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	295-275-9	
Anthracene oil, anthracene-low	90640-82-7	292-604-8	
Anthracene oil, anthracene paste	90640-81-6	292-603-2	
Diisobutyl phthalate (DIBP)	84-69-5	201-553-2	Diisobutyl phthalate is used as plasticiser for nitrocellulose, cellulose ether, polyacrylate and polyacetate dispersions, and as a gelling aid in combination with other plasticisers, which are widely used for plastics, lacquers, adhesives, explosive material and nail polish.
Lead chromate	7758-97-6	231-846-0	Lead chromate is used for manufacturing pigments and dyes, and as a pigment or coating agent in industrial and maritime



Substance Name	(CAS No.)	EC No.	Possible Applications
			paint products or varnishes. Further potential uses may be associated with the formulation of detergents and bleaches, photosensitive materials, the manufacture of pyrotechnic powder or the embalming /restoring of art products.
Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	12656-85-8	235-759-9	Lead chromate molybdate sulphate red (C.I. Pigment Red 104) is used as a colouring, painting and coating agent in sectors such as the rubber, plastic and paints, coatings and varnishes industries. Applications comprise the production of agricultural equipment, vehicles and aircraft as well as road and airstrip painting.
Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	215-693-7	Lead sulfochromate yellow (C.I. Pigment Yellow 34) is used as a colouring, painting and coating agent in sectors such as the rubber, plastic and paints, coatings and varnishes industries. Applications comprise the production of agricultural equipment, vehicles and aircraft as well as road and airstrip painting. The substance is further used for camouflage or ammunition marking in the defence area.
Tris(2-chloroethyl)phosphate	115-96-8	204-118-5	Tris(2-chloroethyl)phosphate is mainly used as an additive plasticiser and viscosity regulator with flame-retarding properties for acrylic resins, polyurethane, polyvinyl chloride and other polymers. Other fields of application are adhesives, coatings, flame resistant paints and varnishes. The main industrial branches to use TCEP are the furniture, the textile and the building industry.
Pitch, coal tar, high temp.	65996-93-2	266-028-2	Pitch, coal tar, high temp. is mainly used in the production of electrodes for Industrial applications. Smaller volumes are dedicated to specific uses such as heavy duty corrosion protection, special purpose paving, manufacture of other



Substance Name	(CAS No.)	EC No.	Possible Applications
			substances and the production of clay targets.
Acrylamide	79-06-1	201-173-7	Acrylamide is almost exclusively used for the synthesis of polyacrylamides, which are used in various applications, in particular in waste water treatment and paper processing. Minor uses of acrylamide comprise the preparation of polyacrylamide gels for research purposes and as a grouting agent in civil.

■ **The Announcement of the Third 8 SVHCs List**

The European Chemicals Agency (ECHA) has added 8 extra chemical Substances of Very High Concern (SVHC) to the Candidate List on 18th June 2010 on top of the 15 SVHC that had been regulated in October 2008, and 15 SVHC in January 2010.

The list of these 8 SVHCs and possible applications are shown below:

Substance Name	CAS No.	EC No.	Possible Applications
Trichloroethylene	79-01-6	201-167-4	Trichloroethylene is mainly used as intermediate in the manufacture of chlorinated and fluorinated organic compounds. Other uses are for cleaning and degreasing of metal parts or as solvent in adhesives.
Boric acid	10043-35-3, 11113-50-1	233-139-2, 234-343-4	Boric acid is widely used on account of its consistency-influencing, flame-retarding, antiseptic and preservative properties. It is a component of detergents and cleaners, adhesives, toys, industrial fluids, brake fluids, glass, ceramics, flame retardants, paints, disinfectants, cosmetics, food additives, fertilisers, insecticides and other products.
Disodium tetraborate, anhydrous	1330-43-4 12179-04-3 1303-96-4	215-540-4	Disodium tetraborate and tetraboron disodium heptaoxide form the same compounds in aqueous solutions.
Tetraboron disodium heptaoxide, hydrate	12267-73-1	235-541-3	Uses include a multitude of applications, e.g. in detergents and cleaners, in glass and glass fibres,



Substance Name	CAS No.	EC No.	Possible Applications
			ceramics, industrial fluids, metallurgy, adhesives, flame retardants, personal care products, biocides, fertilisers.
Sodium chromate	7775-11-3	231-889-5	Sodium chromate is mainly used as an intermediate in the manufacture of other chromium compounds as well as a laboratory analytical agent, but this use is limited. Other potential uses are mentioned in the literature but whether they occur in the EU is not clear.
Potassium chromate	7789-00-6	232-140-5	Potassium chromate is used as a corrosion inhibitor for treatment and coating of metals, for manufacture of reagents, chemicals and textiles, as a colouring agent in ceramics, in the manufacture of pigments/inks and in the laboratory as analytical agent.
Ammonium dichromate	7789-09-5	232-143-1	Ammonium dichromate is mainly used as an oxidising agent. Other known uses are in the manufacture of photosensitive screens and as mordant in the manufacture of textiles. Minor uses seem to comprise metal treatment and laboratory analytical agent.
Potassium dichromate	7778-50-9	231-906-6	Potassium dichromate is used for chrome metal manufacturing and as corrosion inhibitor for treatment and coating of metals. It is further used as textile mordant, as laboratory analytical agent, for cleaning of laboratory glassware, in the manufacture of other reagents and as oxidising agent in photolithography.

#### ■ The Announcement of the Fourth 8 SVHCs List

The ECHA has added eight more chemical Substances of Very High Concern (SVHC) to the Candidate List on 15th December 2010.

The list of these 8 SVHCs and possible applications are shown below:

Substance Name	CAS No.	EC No.	Possible Applications
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Cobalt(II) sulphate	10124-43-3	233-334-2	Mainly used in the production of other chemicals. Further applications may include manufacture of catalysts and driers, surface treatments (such as electroplating), corrosion prevention, production of pigments, decolourising (in glass, pottery), batteries, animal food supplements, soil fertilizers, and others.
Cobalt(II) dinitrate	10141-05-6	233-402-1	Mainly used in the production of other chemicals and the manufacture of catalysts. Further applications may include surface treatment and batteries.
Cobalt(II) carbonate	513-79-1	208-169-4	Mainly used in the manufacture of catalysts. Minor uses may include feed additive, production of other chemicals, production of pigments, and adhesion (in ground coat frit).
Cobalt(II) diacetate	71-48-7	200-755-8	Mainly used in the manufacture of catalysts. Minor uses may include production of other chemicals, surface treatment, alloys, production of pigments, dyes, rubber adhesion, and feed additive.
2-Methoxyethanol	109-86-4	203-713-7	Mainly used as solvent, intermediate and as an additive for fuel. Might also be used in textile finishing.
2-Ethoxyethanol	110-80-5	203-804-1	Mainly used as solvent and chemical intermediate. Might also be used in textile finishing.
Chromium trioxide	1333-82-0	215-607-8	Used for metal finishing and as a fixing agent in waterborne wood preservatives.
Acids generated from chromium trioxide and their oligomers: Chromic acid Dichromic acid Oligomers of chromic acid and dichromic acid	7738-94-5, 13530-68-2	231-801-5 236-881-5	These acids and their oligomers are generated when chromium trioxide is dissolved in water. Chromium trioxide is mainly used in the form of aqueous solutions. Consequently, the uses of these substances are the same as indicated for chromium trioxide.

■ **The Announcement of the Fifth 7 SVHCs List**



The ECHA has added seven more chemical Substances of Very High Concern (SVHC) to the Candidate List on 20th June 2011.

The list of these 7 SVHCs and possible applications are shown below:

Substance Name	CAS No.	EC No.	Possible Applications
2-ethoxyethyl acetate	111-15-9	203-839-2	Solvent and intermediate, formulation of paints, lacquers and varnishes.
strontium chromate	7789-06-2	232-142-6	Inhibitor, pigments, paints, varnishes, oil-colors, sealants, formulations in aeronautic/aerospace sector, coil coating sector of steel and aluminum and vehicle coating sector.
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	271-084-6	Adhesives and binding agents, paint, lacquers and varnishes, construction materials
Hydrazine	302-01-2, 7803-57-8	206-114-9	Hydrazine derivatives in pharmaceuticals, agrochemicals, chemical blowing agents, paints, inks and organic dyes, reagents, monomer in polymerizations, corrosion inhibitor, reducing agent in the deposition metals and purification of chemical reagents, stabilizing agent, laboratory chemical reagent; Propellant for aerospace vehicles, fuel in military gas generators.
1-methyl-2-pyrrolidone	872-50-4	212-828-1	Coatings (paints, printing inks), cleaning products (polymer removers, paint strippers/cleaners), agrochemicals, electronic equipment manufacture, petrochemical processing, pharmaceuticals.
1,2,3-trichloropropane	96-18-4	202-486-1	Pesticides, chlorinated solvents, polysulfide elastomers, hexafluoropropylene.
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	71888-89-6	276-158-1	Plasticiser in PVC, plasticiser in sealants and printing inks, sealants and coatings, printing inks, oil additive.

■ **The Announcement of the sixth 20 SVHCs List**

The ECHA has added twenty more chemical Substances of Very High Concern (SVHC) to the Candidate List on 19th December 2011.

The list of these 20 SVHC and possible applications are shown below:

Substance Name	CAS NO.	EC NO.	Potential Uses
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Dichromium tris(chromate)	24613-89-6	246-356-2	Mainly used in mixtures for metal surface treatment in the aeronautic/aerospace, steel and aluminium coating sectors.
Potassium hydroxyoctaoxidizincatedi-chromate	11103-86-9	234-329-8	Mainly used in coatings in the aeronautic/aerospace, steel and aluminium coil coating and vehicle coating sectors.
Pentazinc chromate octahydroxide	49663-84-5	256-418-0	Mainly used in coatings in the vehicle coating and aeronautic / aerospace sectors.
Zirconia Aluminosilicate Refractory Ceramic Fibres <sup>1</sup>	-	-	Refractory ceramic fibres are used for high-temperature insulation, almost exclusively in industrial applications (insulation of industrial furnaces and equipment, equipment for the automotive and aircraft/aerospace industry) and in fire protection (buildings and industrial process equipment).
Aluminosilicate Refractory Ceramic Fibres	-	-	Refractory ceramic fibres are used for high-temperature insulation, almost exclusively in industrial applications (insulation of industrial furnaces and equipment, equipment for the automotive and aircraft/aerospace industry) and in fire protection (buildings and industrial process equipment).
Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	500-036-1	Mainly used for manufacture of other substances. Minor uses are as hardener for epoxy resins, e.g. for the production of rolls, pipes and moulds, and as well for adhesives.
Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6	No registration for this phthalate compound has been submitted to ECHA. Hence, the substance seems not to be manufactured in or imported to the EU in quantities above 1 t/y. Main uses in the past were as plasticiser in polymeric materials and paints, lacquers and varnishes, including printing inks.



2-Methoxyaniline; o-Anisidine	90-04-0	201-963-1	Mainly used in the manufacture of dyes for tattooing and coloration of paper, polymers and aluminium foil.
4-(1,1,3,3-tetramethylbutyl)phenol	140-66-9	205-426-2	Mainly used in the manufacture of polymer preparations and of ethoxylates. Further used as a component in adhesives, coatings, inks and rubber articles.
1,2-Dichloroethane	107-06-2	203-458-1	Mainly used for manufacture of other substances. Minor uses as solvent in the chemical and pharmaceutical industry.
Bis(2-methoxyethyl) ether	111-96-6	203-924-4	Used primarily as a reaction solvent or process chemical in a wide variety of applications. Used also as solvent for battery electrolytes, and possibly in other products such as sealants, adhesives, fuels and automotive care products.
Arsenic acid	7778-39-4	231-901-9	Mainly used to remove gas bubbles from ceramic glass melt and in the production of laminated printed circuit boards
Calcium arsenate	7778-44-1	231-904-5	Calcium arsenate is present in complex raw materials imported for manufacture of copper, lead and a range of precious metals. It appears mainly to be used as precipitating agent in copper smelting and to manufacture diarsenic trioxide. However, most of the substance seems to be disposed of as waste.
Trilead diarsenate	3687-31-8	222-979-5	Trilead diarsenate is present in complex raw materials imported for manufacture of copper, lead and a range of precious metals. The trilead diarsenate contained in the raw materials is in the metallurgical refinement process transformed to calcium arsenate and diarsenic trioxide. Whereas most of the calcium arsenate appears to be disposed of as waste the diarsenic trioxide is used further.



N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	Used as solvent, mainly in the manufacture of various substances and in the production of fibres for clothing and other applications. Also used as reagent, and in products such as industrial coatings, polyimide films, paint strippers and ink removers.
2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	202-918-9	Mainly used as curing agent in resins and in the production of polymer articles and also for manufacture of other substances. The substance may further be used in construction and arts.
Phenolphthalein	77-09-8	201-004-7	Mainly used as laboratory agent (in pH indicator solutions), for the production of pH-indicator paper and in medicinal products.
Lead azide, Lead diazide	13424-46-9	236-542-1	Mainly used as initiator or booster in detonators for both civilian and military uses and as initiator in pyrotechnic devices.
Lead styphnate	15245-44-0	239-290-0	Mainly used as a primer for small calibre and rifle ammunition. Other common uses are in munition pyrotechnics, powder actuated devices and detonators for civilian use.
Lead dipicrate	6477-64-1	229-335-2	No registration for this substance has been submitted to ECHA. Lead dipicrate is an explosive like lead diazide and lead styphnate. It may be used in low amounts in detonator mixtures together with the two other mentioned lead compounds.

1. 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 ( $\mu\text{m}$ ). c) alkaline oxide and alkali earth oxide ( $\text{Na}_2\text{O}+\text{K}_2\text{O}+\text{CaO}+\text{MgO}+\text{BaO}$ ) content less or equal to 18% by weight
2. 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 and silicon 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 ( $\mu\text{m}$ ) c) alkaline oxide and alkali earth oxide ( $\text{Na}_2\text{O}+\text{K}_2\text{O}+\text{CaO}+\text{MgO}+\text{BaO}$ ) content less or equal to 18% by weight

■ **The Announcement of the seventh 13 SVHCs List**

The ECHA has added thirteen more chemical Substances of Very High Concern (SVHC) to the Candidate List on 18th June 2012.

The list of these 13 SVHCs and possible applications are shown below:

Substance Name	CAS NO.	EC NO.	Potential Uses
1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	112-49-2	203-977-3	Mainly used as a solvent or as a processing aid in the manufacture and formulation of industrial chemicals. Minor use in brake fluids and repair of motor vehicles.
1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	203-794-9	Mainly used as a solvent or as a processing aid in the manufacture and formulation of industrial chemicals, including use as an electrolyte solvent in lithium batteries.
Diboron trioxide	1303-86-2	215-125-8	Used in a multitude of applications, e.g., in glass and glass fibres, frits, ceramics, flame retardants, catalysts, industrial fluids, metallurgy, adhesives, inks/paints, film developers solutions, detergents and cleaners, biocides and insecticides.
Formamide	75-12-7	200-842-0	Mainly used as an intermediate. Minor uses as solvent, as reagent chemical (in the pharmaceutical industry) and as laboratory chemical. The substance seems further to be used in the agrochemical industry and as a plasticiser.
Lead (II) bis (methanesulfonate)	17570-76-2	401-750-5	Mainly used in plating (both electrolytic and electroless) processes for electronic components (such as printed circuit boards).
TGIC(1,3,5-tris (oxiranylmethyl) -1,3,5-triazine-2,4,6 (1H,3H,5H) -trione)	2451-62-9	219-514-3	Mainly used as a hardener in resins and coatings; also used in inks for the printed circuit board industry, electrical insulation material, resin moulding systems, laminated sheeting, silk screen



			printing coatings, tools, adhesives, lining materials and stabilisers for plastics.
$\beta$ -TGIC(1,3,5-tris[(2S and2R)-2,3-epoxypropyl]-1,3,5-triazine-2, 4,6-(1H,3H,5H)-trione)	59653-74-6	423-400-0	Mainly used as a hardener in resins and coatings; also used in inks for the printed circuit board industry, electrical insulation material, resin moulding systems, laminated sheeting, silk screen printing coatings, tools, adhesives, lining materials and stabilisers for plastics.
4,4'-bis(dimethylamino) benzophenone(Michler's ketone)	90-94-8	202-027-5	Intermediate in the manufacture of triphenylmethane dyes and other substances. Further potential uses include as additive (photosensitiser) in dyes and pigments, in dry film products, as a process chemical in the production of electronic circuit boards, in research and development applications.
N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	202-959-2	Intermediate in the manufacture of dyes and other substances. Used also as chemical reagent in research and development.
[4-[4,4'-bis(dimethylamino) benzhydrylidene] cyclohexa-2, 5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) <sup>1</sup>	548-62-9	208-953-6	Used mainly for paper colouring and inks supplied in printer cartridges and ball pens. Further uses include staining of dried plants, marker for increasing the visibility of liquids, staining in microbial and clinical laboratories.
[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) <sup>1</sup>	2580-56-5	219-943-6	Used in the production of inks, cleaners, and coatings, as well as for dyeing of paper, packaging, textiles, plastic products, and other types of articles. It is also used in diagnostic and analytical applications.
$\alpha,\alpha$ -Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene -1-methanol (C.I. Solvent Blue 4) <sup>1</sup>	6786-83-0	229-851-8	Mainly used in the production of printing and writing inks, for dyeing of paper and in mixtures such as windscreen washing agents.
4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol <sup>1</sup>	561-41-1	209-218-2	Used in the production of writing inks and potentially in the production of other inks, as well as for dyeing of a variety of materials.

#### ■ The Announcement of the eighth 54 SVHCs List

The ECHA has added fifty-four more chemical Substances of Very High Concern (SVHC) to the Candidate



List on 19th December 2012.

The list of these 54 SVHCs and possible applications are shown below:

Substance name	EC No.	CAS No.	SVHC property
Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	214-604-9	1163-19-5	PBT; vPvB
Pentacosafuorotridecanoic acid	276-745-2	72629-94-8	vPvB
Tricosafuorododecanoic acid	206-203-2	307-55-1	vPvB
Henicosafuoroundecanoic acid	218-165-4	2058-94-8	vPvB
Heptacosafuorotetradecanoic acid	206-803-4	376-06-7	vPvB
Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	204-650-8	123-77-3	Equivalent level of concern having probable serious effects to human health
Cyclohexane-1,2-dicarboxylic anhydride [1] cis-cyclohexane-1,2-dicarboxylic anhydride [2] trans-cyclohexane-1,2-dicarboxylic anhydride [3] [The individual cis- [2] and trans- [3] isomer substances and all possible combinations of the cis- and trans-isomers [1] are covered by this entry].	201-604-9, 236-086-3, 238-009-9	85-42-7, 13149-00-3, 14166-21-3	Equivalent level of concern having probable serious effects to human health
Hexahydromethylphthalic anhydride [1], Hexahydro-4-methylphthalic anhydride [2], Hexahydro-1-methylphthalic anhydride [3], Hexahydro-3-methylphthalic anhydride [4] [The individual isomers [2], [3] and [4] (including their cis- and trans- stereo isomeric forms) and all possible combinations of the isomers [1] are covered by this entry]	247-094-1, 243-072-0, 256-356-4, 260-566-1	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	Equivalent level of concern having probable serious effects to human health
4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	-	Equivalent level of concern having probable serious effects to the environment
4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	-	Equivalent level of concern having probable serious effects to the environment
Methoxyacetic acid	210-894-6	625-45-6	Toxic for reproduction
N,N-dimethylformamide	200-679-5	68-12-2	Toxic for reproduction
Dibutyltin dichloride (DBTC)	211-670-0	683-18-1	Toxic for reproduction
Lead monoxide (Lead oxide)	215-267-0	1317-36-8	Toxic for reproduction



Orange lead (Lead tetroxide)	215-235-6	1314-41-6	Toxic for reproduction
Lead bis(tetrafluoroborate)	237-486-0	13814-96-5	Toxic for reproduction
Trilead bis(carbonate)dihydroxide	215-290-6	1319-46-6	Toxic for reproduction
Lead titanium trioxide	235-038-9	12060-00-3	Toxic for reproduction
Lead titanium zirconium oxide	235-727-4	12626-81-2	Toxic for reproduction
Silicic acid, lead salt	234-363-3	11120-22-2	Toxic for reproduction
Silicic acid (H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ), barium salt (1:1), lead-doped [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	272-271-5	68784-75-8	Toxic for reproduction
1-bromopropane (n-propyl bromide)	203-445-0	106-94-5	Toxic for reproduction
Methyloxirane (Propylene oxide)	200-879-2	75-56-9	Carcinogenic; Mutagenic
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	284-032-2	84777-06-0	Toxic for reproduction
Diisopentylphthalate (DIPP)	210-088-4	605-50-5	Toxic for reproduction
N-pentyl-isopentylphthalate	-	776297-69-9	Toxic for reproduction
1,2-diethoxyethane	211-076-1	629-14-1	Toxic for reproduction
Acetic acid, lead salt, basic	257-175-3	51404-69-4	Toxic for reproduction
Lead oxide sulfate	234-853-7	12036-76-9	Toxic for reproduction
[Phthalato(2-)]dioxotrilead	273-688-5	69011-06-9	Toxic for reproduction
Dioxobis(stearato)trilead	235-702-8	12578-12-0	Toxic for reproduction
Fatty acids, C16-18, lead salts	292-966-7	91031-62-8	Toxic for reproduction
Lead cyanamate	244-073-9	20837-86-9	Toxic for reproduction
Lead dinitrate	233-245-9	10099-74-8	Toxic for reproduction
Pentalead tetraoxide sulphate	235-067-7	12065-90-6	Toxic for reproduction
Pyrochlore, antimony lead yellow	232-382-1	8012-00-8	Toxic for reproduction
Sulfurous acid, lead salt, dibasic	263-467-1	62229-08-7	Toxic for reproduction
Tetraethyllead	201-075-4	78-00-2	Toxic for reproduction
Tetralead trioxide sulphate	235-380-9	12202-17-4	Toxic for reproduction
Trilead dioxide phosphonate	235-252-2	12141-20-7	Toxic for reproduction
Furan	203-727-3	110-00-9	Carcinogenic
Diethyl sulphate	200-589-6	64-67-5	Carcinogenic ; Mutagenic



Dimethyl sulphate	201-058-1	77-78-1	Carcinogenic
3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	421-150-7	143860-04-2	Toxic for reproduction
Dinoseb (6-sec-butyl-2,4-dinitrophenol)	201-861-7	88-85-7	Toxic for reproduction
4,4'-methylenedi-o-toluidine	212-658-8	838-88-0	Carcinogenic
4,4'-oxydianiline and its salts	202-977-0	101-80-4	Carcinogenic ; Mutagenic
4-aminoazobenzene	200-453-6	60-09-3	Carcinogenic
4-methyl-m-phenylenediamine (toluene-2,4-diamine)	202-453-1	95-80-7	Carcinogenic
6-methoxy-m-toluidine (p-cresidine)	204-419-1	120-71-8	Carcinogenic
Biphenyl-4-ylamine	202-177-1	92-67-1	Carcinogenic
o-aminoazotoluene [(4-o-tolylazo-o-toluidine)]	202-591-2	97-56-3	Carcinogenic
o-toluidine	202-429-0	95-53-4	Carcinogenic
N-methylacetamide	201-182-6	79-16-3	Toxic for reproduction

- The last four SVHCs identification is based on the presence of the carcinogenic constituents Michler's ketone or Michler's base above the concentration limit for classifying the substances as carcinogenic ( $\geq 0.1$  % weight/weight).

#### ■ The Announcement of the ninth 6 SVHCs List

The ECHA has added six more chemical Substances of Very High Concern (SVHC) to the Candidate List on 20th June 2013.

The list of these 6 SVHC and possible applications are shown below:

Substance name	EC No.	CAS No.	SVHC property
Cadmium	231-152-8	7440-43-9	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
Cadmium oxide	215-146-2	1306-19-0	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
Ammonium pentadecafluorooctanoate (APFO)	223-320-4	3825-26-1	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
Pentadecafluorooctanoic acid (PFOA)	206-397-9	335-67-1	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
Dipentyl phthalate (DPP)	205-017-9	131-18-0	Toxic for reproduction (Article 57 c)
4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined	/	/	Equivalent level of concern having probable serious effects to the environment (Article 57 f)



substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]

#### ■ The Announcement of the tenth 7 SVHCs List

The ECHA has added seven more chemical Substances of Very High Concern (SVHC) to the Candidate List on 16th December 2013.

The list of these 7 SVHCs and possible applications are shown below:

Substance name	EC No.	CAS No.	SVHC property
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)	217-710-3	1937-37-7	Carcinogenic (Article 57a)
Trixylyl phosphate	246-677-8	25155-23-1	Toxic for reproduction (Article 57 c)
Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	209-358-4	573-58-0	Carcinogenic (Article 57a)
Dihexyl phthalate	201-559-5	84-75-3	Toxic for reproduction (Article 57 c)
Imidazolidine-2-thione; 2-imidazoline-2-thiol	202-506-9	96-45-7	Toxic for reproduction (Article 57 c)
Cadmium sulphide	215-147-8	1306-23-6	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
Lead di(acetate)	206-104-4	301-04-2	Toxic for reproduction (Article 57 c)

#### ■ The Announcement of the eleventh 4 SVHCs List

The ECHA has added four more chemical Substances of Very High Concern (SVHC) to the Candidate List on 16th June 2014.

The list of these 4 SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
Cadmium chloride	233-296-7	10108-64-2	Carcinogenic (Article 57a); Mutagenic (Article 57b); Toxic for reproduction (Article 57c); Equivalent level of concern having probable serious effects to human health (Article 57 f)
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	271-093-5	68515-50-4	Toxic for reproduction (Article 57 c)
Sodium peroxometaborate	231-556-4	7632-04-4	Toxic for reproduction (Article 57 c)



Sodium perborate; perboric acid, sodium salt	239-172-9; 234-390-0	-	Toxic for reproduction (Article 57 c)
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■ **The Announcement of the 12th 6 SVHCs List**

The ECHA has added six more chemical Substances of Very High Concern (SVHC) to the Candidate List on 17th December 2014.

The list of these 6 SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
Cadmium fluoride	232-222-0	7790-79-6	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Toxic for reproduction (Article 57 c); Equivalent level of concern having probable serious effects to human health (Article 57 f)
Cadmium sulphate	233-331-6	10124-36-4; 31119-53-6	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Toxic for reproduction (Article 57 c); Equivalent level of concern having probable serious effects to human health (Article 57 f)
2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	223-346-6	3846-71-7	PBT (Article 57 d); vPvB (Article 57 e)
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	247-384-8	25973-55-1	PBT (Article 57 d); vPvB (Article 57 e)
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	239-622-4	15571-58-1	Toxic for reproduction (Article 57 c)
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)	-	-	Toxic for reproduction (Article 57 c)

■ **The Announcement of the 13th 2 SVHCs List**

The ECHA has added two more chemical Substances of Very High Concern (SVHC) to the Candidate List on 15th June 2015.

The list of these 2 SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
1,2-benzenedicarboxylic acid, di-C6-10-alkyl	271-094-0;	68515-51-5;	Toxic for reproduction (Article 57 c)



esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate (EC No. 201-559-5)	272-013-1	68648-93-1	
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]	-	-	vPvB (Article 57e)

#### ■ The Announcement of the 14th 5 SVHCs List

The ECHA has added five more chemical Substances of Very High Concern (SVHC) to the Candidate List on 17th December 2015.

The list of these 5 SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
Nitrobenzene	202-716-0	98-95-3	Toxic for reproduction (Article 57 c)
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	223-383-8	3864-99-1	vPvB (Article 57 e)
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	253-037-1	36437-37-3	vPvB (Article 57 e)
1,3-propanesultone	214-317-9	1120-71-4	Carcinogenic (Article 57 a)
Perfluorononan-1-oic-acid and its sodium and ammonium salts	206-801-3	375-95-1 21049-39-8 4149-60-4	Toxic for reproduction (Article 57 c) PBT (Article 57 d)

#### ■ The Announcement of the 15th 1 SVHC List

The ECHA has added one more chemical Substances of Very High Concern (SVHC) to the Candidate List on 20th June 2016.

The list of these 1 SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
Benzo[def]chrysene (Benzo[a]pyrene)	200-028-5	50-32-8	Carcinogenic (Article 57a) Mutagenic (Article 57b) Toxic for reproduction (Article 57c) PBT (Article 57d) vPvB (Article 57e)

#### ■ The Announcement of the 16th 4 SVHC List

The ECHA has added four more chemical Substances of Very High Concern (SVHC) to the Candidate List on 12th January 2017.

The list of these 4 SVHCs and SVHC property are shown below:



Substance name	EC No.	CAS No.	SVHC property
4,4'-isopropylidenediphenol (bisphenol A; BPA)	201-245-8	80-05-7	Toxic for reproduction (Article 57c) Endocrine disrupting properties (Article 57(f) - human health)
Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	206-400-3 - 221-470-5	335-76-2 3830-45-3 3108-42-7	Toxic for reproduction (Article 57c) PBT (Article 57d)
p-(1,1-dimethylpropyl)phenol	201-280-9	80-46-6	Equivalent level of concern having probable serious effects to environment (Article 57f)
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]	-	-	Equivalent level of concern having probable serious effects to environment (Article 57f)

■ **The Announcement of the 17th 1 SVHC List**

The ECHA has added one more chemical Substances of Very High Concern (SVHC) to the Candidate List on 7th July 2017.

The list of one SVHCs and SVHC property are shown below:

Substance name	EC No.	CAS No.	SVHC property
Perfluorohexane-1-sulphonic acid and its salts (PFHxS)	-	-	vPvB (Article 57e)

- According to REACH regulation, all EU manufacturers or importers of the 174 SVHCs should fulfill either one of the following regulatory obligations:
  1. should supply Safety Data Sheet (SDS/MSDS) to their downstream users when the SVHC concerned is sold as a substance on itself; or
  2. should supply SDS/MSDS to their downstream users when the SVHC concerned is produced or imported at or above 0.1% w/w in a mixture or preparation; or
  3. should supply the product recipient or in request of the product consumers, with available sufficient information, free of charge, which covers at least the name of the substance, within 45 days on receiving the request, if the SVHC is above 0.1% w/w threshold in an article.
- All EU manufacturers or importers must submit a notification for SVHCs placed on EU market before June 1, 2011 to European Chemicals Agency (ECHA), if the substance is produced or imported above the quantity of 1 tonne per year and its concentration percentage in the article above the threshold of 0.1% w/w.



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