

# ABB List of Prohibited and Restricted Substances, ver. 1.12.

This document is valid as of 2018-07-02

The objective with ABB List of Prohibited and Restricted Substances is to achieve compliance with legislation. Legislative changes in between two versions of the list shall always be considered.

This document provides information about “Prohibited substances”, substances that must not be used, and “Restricted substances”, substances whose use should be limited within ABB.

The scope for this list is goods supplied to ABB, product development, production processes, products, packaging materials, service activities and construction sites.

## Principles

The purpose of this list is to comply with legislation to avoid chemical elements and compounds that may represent hazards to the environment or the health of workers, customers, consumers and other stakeholders, or could negatively influence end-of-life properties, or might cause other concerns.

This document contains substances relevant to ABB. The document is reviewed and updated twice per year, in January and July/ August mainly based on the update of REACH Candidate list in January and in the middle of the year.

Prohibited substances must not be used in concentrations that exceed the thresholds under the law. For restricted substances above 0.1% w/w\* or other limits according to legislation (see column “Comments”), active work shall be performed to eliminate the substances or to find less hazardous alternatives which, could be introduced as soon as it is technically and economically possible.

\*The concentration of chemical elements and compounds shall be calculated for constituent articles in a product. See [European Court of Justice ruling for REACH article 33](#).

## How to read this list

### Substance name

Name of chemical element or compound.

### CAS No.

CAS Registry Numbers are unique numerical identifiers assigned by the Chemical Abstracts Service to every chemical described in the open scientific literature.

### Reason for inclusion

The reason for a chemical element or compound to be on this list is its inherent properties that make it hazardous for humans or for the environment.

- PBT - Persistent, Bioaccumulating and Toxic
- vPvB - very Persistent and very Bioaccumulating
- STOT - Specific target organ toxicity

### ABB classification

Classification in Prohibited (P) and Restricted (R). Note that a chemical may be Restricted in certain applications and Prohibited in others.

### Legislation

A reference list to relevant legislation.

### Example of applications

Example of applications where a specific chemical element or compound is used.

### Comments

Information about EU REACH Sunset dates and non-EU legislation thresholds and limits.

| Substance                                       | CAS No.   | Reason for inclusion  | ABB classification | Legislation  | Example of applications  | Comments  |
|---|-----------|---|--------------------|--|--|---|
| 1 -methyl-2-pyrrolidone                         | 872-50-4  | Toxic for reproduction  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California Prop 65                                     | Solvent in paint, varnish, cleaning agents, pesticides etc.    |   |
| 1,1,1-trichloroethane                           | 71-55-6   | Substance that deplete the ozone layer                              | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN Tox. Subs<br>US 40 CFR Ch  | Degreasing   |   |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113) | 76-13-1   | Substance that deplete the ozone layer                              | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN Tox. Subs.<br>US 40 CFR Ch   | Cooling agent  |   |
| 1,1,2-trichloroethene (Trichloroethylene)       | 79-01-6   | Carcinogenic  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65 | Solvent, cleaning agent  | EU: sunset date 21/04/2016  |
| 1,1-dichloro-1-fluoroethane (HCFC-141b)         | 1717-00-6 | Substance that deplete the ozone layer                              | R                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN Tox. Subs.<br>US 40 CFR Ch   | Cooling agents, blowing agent PUR foam                         |   |
| 1,2,3,4,5,6-hexachlorocyclohexane (lindane)     | 58-89-9   | Acute toxicity; Hazardous to the environment; Serious health hazard | P                  | CH SR 814.81 A1<br>FR ECA R521-4 to 42<br>EC 850/2004<br>US 40 CFR Ch<br>2001/852/EC   | Insecticide  | P in all applications. Switzerland: P in all applications. Limit value: 0.001% w/w of total halogenated biphenyls in lubrication oils and greases manufactured from waste oils. |
| 1,2,3-Trichloropropane                          | 96-18-4   | Carcinogenic and toxic for reproduction                             | R                  | EC 1907/2006/C<br>US 40 CFR Ch. (7-1-10 Edition) #372,65(a)<br>California Prop 65  | Painter mediate and varnish remover, solvent, degreasing agent |   |

| Substance  | CAS No.                   | Reason for inclusion                   | ABB classification | Legislation   | Example of applications  | Comments                 |
|--|---------------------------|--|--------------------|---|--|--------------------------|
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate | 68515-51-5,<br>68648-93-1 | Toxic for reproduction                 | R                  | EC 1907/2006/C  | Used to make polymer foils, PVC products, plastic products, and rubber products, in coatings, cable compounding, cable applications, artist supplies and adhesives |                          |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich   | 71888-89-6                | Toxic for reproduction                 | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Used in PVC products   | EU: sunset date 4/7/2020 |
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters  | 68515-42-4                | Toxic for reproduction                 | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Used in PVC products   | EU: sunset date 4/7/2020 |
| 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear   | 68515-50-4                | Toxic for reproduction                 | R                  | EC 1907/2006/C  | In plastic articles  |                          |
| 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear   | 84777-06-0                | Toxic for reproduction                 | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Explosives, phlegmatizer   | EU: sunset date 4/7/2020 |
| 1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)  | 112-49-2                  | Toxic for reproduction                 | R                  | EC 1907/2006/C  | Solvents and help-chemicals in the manufacture of industrial chemicals. Various petroleum products for motor vehicles  |                          |
| 1,2-dibromo-1,1,2,2-tetrafluoroethane (Halon-2402)   | 124-73-2                  | Substance that deplete the ozone layer | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN Tox. Subs.<br>US 40 CFR Ch                  | Fire extinguisher  |                          |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC-114)   | 76-14-2                   | Substance that deplete the ozone layer | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch | Cooling agent  |                          |

| Substance   | CAS No.    | Reason for inclusion                   | ABB classification | Legislation   | Example of applications  | Comments                   |
|---|------------|--|--------------------|---|--|----------------------------|
| 1,2-dichloroethane  | 107-06-2   | Carcinogenic                           | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California prop 65 | Solvent  | EU: sunset date 22/11/2017 |
| 1,2-diethoxyethane  | 629-14-1   | Toxic for reproduction                 | R                  | EC 1907/2006/C  |  |                            |
| 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)   | 110-71-4   | Toxic for reproduction                 | R                  | EC 1907/2006/C  | Solvents and help-chemicals in the manufacture of industrial chemicals. As electrolyte in lithium batteries. |                            |
| 1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (TGIC)<br>Triglycidylisocyanurate (TGIC)  | 2451-62-9  | Mutagenic                              | R                  | EC 1907/2006/C  | Curing-agent. Coating and laminating, printing ink, screen printing. Powder paints                           |                            |
| 1,3,5-tris-[(2S and 2R)-2,3-epoxypropyl]- 1,3,5-triazine-2,4,6-(1H, 3H, 5H)-trione) (B-TGIC)  | 59653-74-6 | Mutagenic                              | R                  | EC 1907/2006/C  | Metal products such as tools. Plastic goods (softener)   |                            |
| 1,3-propanesultone  | 1120-71-4  | Carcinogenic                           | R                  | EC 1907/2006/C  | Electrolyte fluid of lithium ion batteries   |                            |
| 1,6,7,8,9,14,15,16,17,17,18,18 -<br>Dodecachloropentacyclo[12.2.1.1 <sup>6,9</sup> .0 <sup>2,13</sup> .0 <sup>5,10</sup> ]octadeca-7,15-diene ("Dechlorane Plus" <sup>TM</sup> )<br>[covering any of its individual anti- and syn-isomers or any combination thereof] | -          | vPvB                                   | R                  | EC 1907/2006/C  | Used as a non-plasticising flame retardant, used in adhesives and sealants and in binding agents.            |                            |
| 1-bromopropane (n-propyl bromide)   | 106-94-5   | Toxic for reproduction                 | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>California Prop 65  | Solvent  | EU: sunset date 4/7/2020   |
| 1-Chloro-1,1,2,2,2-pentafluoroethane (CFC-115)  | 76-15-3    | Substance that deplete the ozone layer | P                  | EC 2037/2000<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch   | Cooling agent  |                            |

| Substance  | CAS No.    | Reason for inclusion                   | ABB classification | Legislation   | Example of applications   | Comments                   |
|--|------------|--|--------------------|---|---|----------------------------|
| 1-chloro-1,1-difluoroethane (HCFC-142b)                              | 75-68-3    | Substance that deplete the ozone layer | R                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>US 40 CFR Ch       | Cooling agents, blowing agent PUR foam  |                            |
| 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) | 36437-37-3 | vPvB                                   | R                  | EC 1907/2006/C  | UV-protection agents in coatings, plastics, rubber and cosmetics  |                            |
| 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)             | 25973-55-1 | PBT;<br>vPvB                           | R                  | EC 1907/2006/C  | UV-absorbers, especially for transparent plastic materials. UV-protection agents in coatings especially for cars and special industrial wood coatings. UV-protection agents for plastics, rubber and polyurethanes. |                            |
| 2,4-dinitrotoluene   | 121-14-2   | Carcinogenic                           | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California Prop 65 | Explosives  | EU: sunset date 21/08/2015 |
| 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)       | 3864-99-1  | vPvB                                   | R                  | EC 1907/2006/C  | UV-protection agents in coatings, plastics, rubber and cosmetics  |                            |
| 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)                 | 3846-71-7  | PBT;<br>vPvB                           | R                  | EC 1907/2006/C;<br>Japan (Law Concerning the Examination and Regulation of Manufacture)   | UV-absorbers, especially for transparent plastic materials. UV-protection agents in coatings especially for cars and special industrial wood coatings. UV-protection agents for plastics, rubber and polyurethanes. |                            |
| 2-ethoxyethanol  | 110-80-5   | Toxic for reproduction                 | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California Prop 65                     | Solvent in paint  |                            |

| Substance   | CAS No.     | Reason for inclusion  | ABB classification | Legislation   | Example of applications  | Comments                                  |
|---|-------------|---|--------------------|---|--|---|
| 2-ethoxyethyl acetate   | 111-15-9    | Toxic for reproduction  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>California Prop 65                                   | Solvent in paint and varnish   |   |
| 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)  | 15571-58-1  | Toxic for reproduction  | R                  | EC 1907/2006/C  | Might be used as heat stabilizer in plastic (mainly PVC processing)  |   |
| 2-Methoxyaniline; o-Anisidine   | 90-04-0     | Carcinogenic  | R                  | EC 1907/2006/C<br>California Prop 65  | Mainly used in the manufacture of dyes for tattooing and coloration of paper, polymers and aluminum foil.                            |   |
| 2-methoxyethanol  | 109-86-4    | Toxic for reproduction  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65 | Solvent in paint   |   |
| 2-methoxyethyl acetate  | 110-49-6    | Toxic for reproduction  | R                  | CAN NPRI 2010<br>CAN Tox. Subs.<br>California Prop 65                                   | Paints, lacquers   |   |
| 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine  | 143860-04-2 | Toxic for reproduction  | R                  | EC 1907/2006/C  |  |   |
| 4-(1,1,3,3-tetramethylbutyl)phenol  | 140-66-9    | Equivalent level of concern having probable serious effects to the environment          | R                  | EC 1907/2006/C<br>CH SR 814.81 A1<br>CAN NPRI 2010                                      | Used in varnish and paint and for surface treatment of plastics and rubber   | In Switzerland P in certain applications. |
| 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated (covering well-defined substances and UVCB substances, polymers and homologues) | No data     | Endocrine disrupting properties   | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  |  | EU: Sunset date 4/1/2021                  |
| 4,4'-isopropylidenediphenol (bisphenol A; BPA)  | 80-05-7     | Toxic for reproduction; Endocrine disrupting properties to human health and environment | R                  | EC 1907/2006/C  | Manufacture of polycarbonate, as a hardener for epoxy resins, as an anti-oxidant for processing PVC and in thermal paper production. |   |

| Substance  | CAS No.   | Reason for inclusion       | ABB classification | Legislation  | Example of applications   | Comments                   |
|--|-----------|----------------------------|--------------------|--|---|----------------------------|
| 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  | Carcinogenic               | R                  | EC 1907/2006/C   | Manufacture of ink and paint. Staining of different materials.  |                            |
| 4,4'-bis(dimethylamino)benzophenone (Michler's ketone)   | 90-94-8   | Carcinogenic               | R                  | EC 1907/2006/C   | Dyeing of paper, ink in cartridges and pens, plant dyeing. Laboratory chemicals, paper goods.   |                            |
| 4,4'-diaminodiphenylmethane (MDA)  | 101-77-9  | Carcinogenic               | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>California Prop 65 | Hardener for plastics and adhesives   | EU: sunset date 21/08/2014 |
| 4,4'-methylenebis[2-chloroaniline]   | 101-14-4  | Carcinogenic               | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV                       | Hardener in resins and polymers   | EU: sunset date 22/11/2017 |
| 4,4'-methylenedi-o-toluidine   | 838-88-0  | Carcinogenic               | R                  | EC 1907/2006/C<br>California Prop 65                     | An intermediate to paint, textiles  |                            |
| 4,4'-oxydianiline and its salts  | 101-80-4  | Carcinogenic;<br>Mutagenic | R                  | EC 1907/2006/C<br>California Prop 65                     | Intermediate  |                            |
| 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 | Carcinogenic               | R                  | EC 1907/2006/C   | Ink, paint, detergents. Dyeing of paper, packaging textiles and plastic products. Paper products, packaging materials, textiles and plastics. |                            |
| 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  | Carcinogenic               | R                  | EC 1907/2006/C   | Dyeing of paper, ink used in cartridges and ballpoint pens, plant dyeing. Laboratory chemicals, paper goods.                                  |                            |
| 4-Aminoazobenzene  | 60-09-3   | Carcinogenic               | R                  | EC 1907/2006/C<br>California Prop 65                     | Textile   |                            |

| Substance   | CAS No.               | Reason for inclusion   | ABB classification | Legislation                        | Example of applications   | Comments                 |
|---|-----------------------|--|--------------------|------------------------------------|---|--------------------------|
| 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     | R                  | EC 1907/2006/C                     | Manufacture of polymers; formulation into lubricants                      |                          |
| 4-methyl-m-phenylenediamine (toluene-2,4-diamine)   | 95-80-7               | Carcinogenic   | R                  | EC 1907/2006/C                     | Textile. Intermediate for the production of toluene diisocyanate and dyes |                          |
| 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]  | See note 1 in "Notes" | Equivalent level of concern having probable serious effects to the environment | R                  | EC 1907/2006/C                     | Cleaning agent  |                          |
| 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 substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof] | See note 2 in "Notes" | Endocrine disrupting properties  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV | Cleaning agent  | EU: Sunset date 4/1/2021 |

| Substance   | CAS No.                  | Reason for inclusion                                  | ABB classification | Legislation  | Example of applications  | Comments   |
|---|--------------------------|---|--------------------|--|--|--|
| 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] | See note 3 in "Notes"    | vPvB  | R                  | EC 1907/2006/C   | Fragrance ingredient   |  |
| 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)  | 81-15-2                  | vPvB  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV   | Used in rinsing agents, detergents and metal polish  | EU: sunset date 21/08/2014   |
| 6-methoxy-m-toluidine (p-cresidine)   | 120-71-8                 | Carcinogenic  | R                  | EC 1907/2006/C   | Used in the production of various azo dyes   |  |
| Acetic acid, lead salt, basic   | 51404-69-4               | Toxic for reproduction                                | R                  | EC 1907/2006/C   | Coatings, paints, laboratory chemicals   |  |
| Acids generated from chromium trioxide and their oligomers.<br>Group containing: Chromic acid, Dichromic acid, Dichromic acid, Oligomers of chromic acid and dichromic acid   | 7738-94-5,<br>13530-68-2 | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV   | Wood preservatives.<br>Surface treatment of metals.  | EU: sunset date 21/09/2017   |
| Acrylamide  | 79-06-1                  | Carcinogenic;<br>Mutagenic                            | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII<br>CAN NPRI 2010<br>CAN Tux. Subs.<br>US 40 CFR Ch | Plastic packaging.   |  |
| Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)   | 85535-84-8               | PBT;<br>vPvB  | R                  | EC 1907/2006/C<br>CH SR 814.81 A1<br>CAN NPRI 2010                                     | Used as flame retardants.<br>Occurs in paints and sealants, coolant and lubricants, in articles of plastics and rubber, cutting oils and cutting fluids. | In Switzerland P in paints and varnishes, sealants, plastics and rubbers, and textiles. Limit value: 1% w/w. |
| Alkanes, C14-17, chloro (Chlorinated Paraffins)   | 85535-85-9               | PBT   | R                  | 1999/721/EC<br>EC 1907/2006  | Cutting oil, lubricant.<br>Plasticizer   |  |

| Substance   | CAS No.    | Reason for inclusion                                  | ABB classification | Legislation  | Example of applications   | Comments                   |
|---|------------|---|--------------------|--|---|----------------------------|
| Aluminosilicate Refractory Ceramic Fibres             |            | Carcinogenic  | R                  | EC 1907/2006/C<br>CAN Tox. Subs.   | Insulation materials for industrial use. Fire protection in industrial equipment.                                   |                            |
| Ammonium dichromate                                   | 7789-09-5  | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs.      | Used for surface coating  | EU: sunset date 21/09/2017 |
| Ammonium pentadecafluorooctanoate (APFO)              | 3825-26-1  | Toxic for reproduction                                | R                  | EC 1907/2006/C   | Processing aid in the production of fluoropolymers  |                            |
| Anthracene  | 120-12-7   | PBT   | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>US 40 CFR Ch                            | Available in pyrotechnics and in paints and waterproof coatings.  |                            |
| Anthracene oil  | 90640-80-5 | Carcinogenic;<br>PBT;<br>vPvB                         | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>EC 1907/2006/XVII<br>CH SR 814.81 A2 | Used in manufacture of anthracene and carbon black.   | EU: sunset date 4/10/2020  |
| Anthracene oil, anthracene paste                      | 90640-81-6 | Carcinogenic;<br>PBT;<br>vPvB                         | R                  | EC 1907/2006/C   | Used in manufacture of anthracene and carbon black.   |                            |
| Anthracene oil, anthracene paste, anthracene fraction | 91995-15-2 | Carcinogenic;<br>PBT;<br>vPvB                         | R                  | EC 1907/2006/C   | Used in manufacture of anthracene and carbon black.   |                            |
| Anthracene oil, anthracene paste, distn. lights       | 91995-17-4 | Carcinogenic;<br>PBT;<br>vPvB                         | R                  | EC 1907/2006/C   | Used in manufacture of anthracene and carbon black.   |                            |
| Anthracene oil, anthracene-low                        | 90640-82-7 | Carcinogenic;<br>PBT;<br>vPvB                         | R                  | EC 1907/2006/C   | Used in manufacture of anthracene and carbon black.   |                            |
| Arsenic acid  | 7778-39-4  | Carcinogenic  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>EC 1907/2006/XVII                    | Mainly used to remove gas bubbles from ceramic glass melt and in the production of laminated printed circuit boards | EU: sunset date 22/08/2017 |

| Substance  | CAS No.   | Reason for inclusion   | ABB classification | Legislation  | Example of applications  | Comments  |
|--|---|--|--------------------|--|--|---|
| Arsenic compounds  |   | Toxic to aquatic organisms; May cause long-term adverse effects in the aquatic environment | R                  | EC 1907/2006/XVII<br>CH SR 814.81 A2<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch  | Electronic equipment   | Germany: P in treatment of water and in wood-based materials.<br>CH: P in wood-based materials. Limit value: 0,0025 % w/w.  |
| Asbestos (incl. Brown, blue and white asbestos, Tremolite)                   | 1332-21-4,<br>77536-66-4,<br>77536-68-6,<br>12172-73-5,<br>77536-67-5,<br>12001-29-5,<br>132207-32-0,<br>12001-28-4 | Carcinogenic   | P                  | EC 1907/2006/XVII<br>(N/A for 1332-21-4)<br>CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65 | Thermal insulation   |   |
| Benz[a]anthracene  | 56-55-3   | Carcinogenic;<br>PBT;<br>vPvB  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII  | Normally not produced intentionally but rather occurs as a constituent or impurity in other substances.                            |   |
| Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride) (TMA) | 552-30-7  | Respiratory sensitising properties - human health  | R                  | EC 1907/2006/C   | Used in the manufacture of esters and polymers   |   |
| Benzo[ghi]perylene   | 191-24-2  | PBT;<br>vPvB   | R                  | EC 1907/2006/C   | Not registered under REACH. Normally not produced intentionally but rather occurs as a constituent or impurity in other substances |   |
| Benzyl butyl phthalate (BBP)   | 85-68-7   | Toxic for reproduction;<br>Endocrine disrupting properties                                 | P                  | R  | EC 1907/2006/C   | Used as plasticizer in polymer products, mainly in PVC. Occurs in colours, materials to plastic, rubber, glue, filling medium and raw materials for paints.<br>EU: sunset date 21/05/2015 |

| Substance  | CAS No.                   | Reason for inclusion  | ABB classification | Legislation   | Example of applications   | Comments  |
|--|---------------------------|---|--------------------|---|---|---|
| Biphenyl-4-ylamine   | 92-67-1                   | Carcinogenic  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII<br>CH SR 814.81 A1<br>US 40 CFR Ch<br>California Prop 65                                | Intermediate, dyes, pigments, textiles  |   |
| Bis (2-ethylhexyl)phthalate (DEHP)                             | 117-81-7                  | Equivalent level of concern having probable serious effects to the environment;<br>Toxic for reproduction;<br>Endocrine disrupting properties | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>2011/65/EC<br>CAN NPRI 2010<br>CAN Tox. Subs<br>US 40 CFR Ch<br>California Prop 65    | Used as plasticizer in PVC. Occurs also in colours, plastic, rubber, glue, filling medium and raw materials for paints. | EU: sunset date 21/02/2015  |
| Bis(2-methoxyethyl) ether                                      | 111-96-6                  | Toxic for reproduction  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Used primarily as a reaction solvent or process chemical. Solvent for battery electrolytes.                             | EU: sunset date 22/08/2017  |
| Bis(2-methoxyethyl) phthalate                                  | 117-82-8                  | Toxic for reproduction  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Used as plasticizer in paint and varnish.   | EU: sunset date 4/7/2020  |
| Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE) | 1163-19-5                 | PBT;<br>vPvB  | P                  | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII<br>CH SR 814.81 A1<br>2011/65/EU<br>CAN NPRI 2010<br>CAN Tox. Subs<br>US 40 CFR Ch | Flame retardants, insulation materials, electrical equipment, textiles, plastics in automotive industry                 | R in all applications except:<br>EU: P in all applications covered by RoHS.<br>CH: P as flame retardant in EEE covered by RoHS Directive. |
| Bis(tributyltin)oxide (TBTO)                                   | 56-35-9                   | PBT   | R                  | EC 1907/2006/C<br>US 40 CFR Ch.   | Occurs as a preservative in textiles, paper, leather, rubber and polymer materials                                      |   |
| Boric acid   | 10043-35-3,<br>11113-50-1 | Toxic for reproduction  | R                  | EC 1907/2006/C  | Used as wood preservative, flame retardant etc. Can be used in treated wood and flame-proof insulation.                 |   |

| Substance                               | CAS No.                                 | Reason for inclusion  | ABB classification | Legislation  | Example of applications   | Comments |
|---|---|---|--------------------|--|---|----------|
| Bromochlorodifluoromethane (Halon-1211) | 353-59-3                                | Substance that deplete the ozone layer  | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch                                      | Fire extinguisher   |          |
| Cadmium and cadmium compounds           | 7440-43-9 (Cd)<br>See note 5 in "Notes" | Flammable;<br>Acute toxicity;<br>Hazardous to the environment;<br>Serious health hazard   | P                  | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>2011/65/EU<br>2006/66/EC<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch | Cadmium and cadmium compounds. Electric and electronic equipment covered by RoHS  |          |
| Cadmium carbonate                       | 513-78-0                                | Carcinogenic;<br>Mutagenic;<br>STOT RE  |                    | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII   | Used as a pH regulator and in water treatment products, laboratory chemicals, cosmetics and personal care products.     |          |
| Cadmium chloride                        | 10108-64-2                              | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction;<br>Equivalent level of concern having probable serious effects to human health |                    | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII   | Industrial and laboratory chemicals, which are used in surface treatment and the manufacture of other cadmium compounds |          |
| Cadmium fluoride                        | 7790-79-6                               | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction;<br>Equivalent level of concern having probable serious effects to human health |                    | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII   | Used in oxygen-sensitive applications, such as metal production.  |          |

| Substance         | CAS No.                   | Reason for inclusion  | ABB classification | Legislation                         | Example of applications  | Comments |
|-------------------|---------------------------|---|--------------------|-------------------------------------|--|----------|
| Cadmium hydroxide | 21041-95-2                | Carcinogenic;<br>Mutagenic;<br>STOT RE  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII | Used for the manufacture of electrical, electronic and optical equipment and in laboratory chemicals.  |          |
| Cadmium nitrate   | 10325-94-7                | Carcinogenic;<br>Mutagenic;<br>STOT RE  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII | Used for the manufacture of glass, porcelain and ceramic products and in laboratory chemicals.   |          |
| Cadmium oxide     | 1306-19-0                 | Carcinogenic;<br>Equivalent level of concern having probable serious effects to human health  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII | Used in electronics, for pigments, batteries, and electroplating.  |          |
| Cadmium sulphate  | 10124-36-4,<br>31119-53-6 | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction;<br>Equivalent level of concern having probable serious effects to human health | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII | Used for the electroplating of cadmium in electronic circuits. It is also a precursor to cadmium-based pigment such as cadmium sulfide. It is also used for electrolyte in a Weston standard cell as well as a pigment in fluorescent screens. |          |
| Cadmium sulphide  | 1306-23-6                 | Carcinogenic;<br>Equivalent level of concern having probable serious effects to human health  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII | Used as a pigment, in manufacturing of photo resistors and in thin-film form combined with other layers for use in certain types of solar cells.   |          |

| Substance                                 | CAS No.               | Reason for inclusion                    | ABB classification | Legislation   | Example of applications   | Comments   |
|---|-----------------------|---|--------------------|---|---|--|
| Calcium arsenate                          | 7778-44-1             | Carcinogenic                            | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII   | 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. |  |
| Chlorodifluoromethane (HCFC-22)           | 75-45-6               | Substance that deplete the ozone layer  | R                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>US 40 CFR Ch | Cooling agents, blowing agent PUR foam.   |  |
| Chrome (VI+) and compounds contain Cr(VI) | See note 6 in "Notes" | Carcinogenic                            | P                  | R   | CH SR 814.81 A2<br>2011/65/EU<br>CAN NPRI 2010<br>CAN Tox. Subs.  | Electric and electronic equipment covered by RoHS. Surface treatment. Pigment in paint.<br>EU: P in all applications covered by RoHS.<br>CH: P in packaging, limit value: 0.01% w/w. |
| Chromium trioxide                         | 1333-82-0             | Carcinogenic; Mutagenic                 | P                  |   | EC 1907/2006/C<br>EC 1907/2006/XIV<br>2011/65/EU  | Electric and electronic equipment covered by RoHS. Wood preservative. Surface treatment of metals.<br>EU: sunset date 21/09/2017   |
| Chrysene                                  | 218-01-9              | Carcinogenic; PBT; vPvB                 | R                  |   | EC 1907/2006/C<br>EC 1907/2006/XVII   | Normally not produced intentionally but rather occurs as a constituent or impurity in other substances   |
| Cobalt(II) carbonate                      | 513-79-1              | Carcinogenic and toxic for reproduction | R                  |   | EC 1907/2006/C<br>ListCAN NPRI for 2010 -<br>Schedule 1 Part 1<br>Group 1 Substances  | A precursor to cobalt carbonyl and various cobalt salts  |
| Cobalt(II) diacetate                      | 71-48-7               | Carcinogenic; Toxic for reproduction    | R                  |   | EC 1907/2006/C<br>CAN NPRI 2010   | Surface treatment of metals.   |
| Cobalt(II) dinitrate                      | 10141-05-6            | Carcinogenic; Toxic for reproduction    | R                  |   | EC 1907/2006/C<br>CAN NPRI 2010   | Surface treatment of metals.   |

| Substance  | CAS No.                               | Reason for inclusion  | ABB classification | Legislation   | Example of applications  | Comments                   |
|--|---------------------------------------|---|--------------------|---|--|----------------------------|
| Cobalt(II) sulphate  | 10124-43-3                            | Carcinogenic;<br>Toxic for reproduction                                     | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>California Prop 65                                       | Pigment. Surface treatment.  |                            |
| Cobalt dichloride  | 7646-79-9                             | Carcinogenic and toxic for reproduction                                     | R                  | EC 1907/2006/C<br>CAN NPRI for 2010 - Schedule 1 Part 1 Group 1 Substances                  | Surface treatment  |                            |
| Cyclohexane-1,2-dicarboxylic anhydride [1],<br>cis-cyclohexane-1,2-dicarboxylic anhydride [2],<br>trans-cyclohexane-1,2-dicarboxylic anhydride [3]<br>[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] | 85-42-7,<br>13149-00-3,<br>14166-21-3 | Equivalent level of concern having probable serious effects to human health | R                  | EC 1907/2006/C  | Plasticizers, polyester, alkydes, motor insulation, hardener for epoxy resin   |                            |
| Decamethylcyclopentasiloxane (D5)  | 541-02-6                              | PBT;<br>vPvB  | R                  | EC 1907/2006/C  | Used in washing and cleaning products, polishes and waxes, cosmetics and personal care products, textile treatment products and dyes |                            |
| Diarsenic pentaoxide   | 1303-28-2                             | Carcinogenic  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>CAN NPRI 2010 | Used in wood preservatives, in the paint industry, metallurgy and in the manufacture of special glass.                               | EU: sunset date 21/05/2015 |
| Diarsenic trioxide   | 1327-53-3                             | Carcinogenic  | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>CAN NPRI 2010 | Used in dyeing of glass and enamel. Used in the manufacture of special glass. Has previously been used as wood preservative.         | EU: sunset date 21/05/2015 |

| Substance   | CAS No.    | Reason for inclusion  | ABB classification | Legislation   | Example of applications  | Comments                   |
|---|------------|---|--------------------|---|--|----------------------------|
| Diazene-1,2-dicarboxamide (C,C'-azodi(formamide)) | 123-77-3   | Equivalent level of concern having probable serious effects to human health | R                  | EC 1907/2006/C  | Raw material for the manufacture of rubber and plastic, rubber and plastic products  |                            |
| Diboron trioxide                                  | 1303-86-2  | Toxic for reproduction  | R                  | EC 1907/2006/C  | Raw material for the manufacture of glass, glassware, ceramics and metals. Paints, varnishes, inks, flame retardants, catalysts, detergent. The glassware and enameled glass products. Imported roared protected wood products |                            |
| Dibutyl phthalate (DBP)                           | 84-74-2    | Toxic for reproduction; Endocrine disrupting properties                     | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>2011/65/EC<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California prop 65   | Occurs in various articles of plastic, mainly PVC. Occurs in glue, paints, plastics, rubber etc.   | EU: sunset date 21/02/2015 |
| Dibutyltin dichloride (DBTC)                      | 683-18-1   | Toxic for reproduction  | R                  | EC 1907/2006/C  | Rubber manufacturing, rubber products  |                            |
| Dichlorodifluoromethane (CFC-12)                  | 75-71-8    | Substance that deplete the ozone layer                                      | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN Tox. Subs.<br>US 40 CFR Ch  | Cooling agent  |                            |
| Dichloromethane (methylene chloride)              | 75-09-2    | Health hazard   | P                  | R<br>EC 1907/2006/XVII<br>CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>90/415/EC<br>96/55/EC<br>EC 2037/2000<br>California Prop 65 | Paint stripping (prohibited)<br>Other applications such as degreasing (restricted)   |                            |
| Dichromium tris(chromate)                         | 24613-89-6 | Carcinogenic  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Used for surface treatment.  | EU: sunset date 22/01/2019 |

| Substance  | CAS No.    | Reason for inclusion  | ABB classification | Legislation   | Example of applications   | Comments                   |
|--|------------|---|--------------------|---|---|----------------------------|
| Dicyclohexyl phthalate (DCHP)  | 84-61-7    | Toxic for reproduction;<br>Endocrine disrupting properties - human health | R                  | EC 1907/2006/C  | Used in plastisol, PVC, rubber and plastic articles. A further use is also as a phlegmatiser and dispersing agent for formulations of organic peroxides |                            |
| Diethyl sulphate   | 64-67-5    | Carcinogenic;<br>Mutagenic  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65 | An intermediate   |                            |
| Dihexyl phthalate  | 84-75-3    | Toxic for reproduction  | R                  | EC 1907/2006/C<br>California Prop 65  | Plasticizer in PVC  |                            |
| Diisobutyl phthalate (DIBP)  | 84-69-5    | Toxic for reproduction;<br>Endocrine disrupting properties                | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>2011/65/EC  | Solvent in adhesives, inks for paper and packaging.   | EU: sunset date 21/02/2015 |
| Diisopentylphthalate   | 605-50-5   | Toxic for reproduction  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Explosives  | EU: sunset date 4/07/2020  |
| Dimethyl sulphate  | 77-78-1    | Carcinogenic  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65 | An intermediate   |                            |
| Dimethylfumarate (DMFu)  | 624-49-7   | Health hazard   | P                  | EC 1907/2006/XVII<br>2009/251/EC  | Drying and anti-mold agents, silica gel   |                            |
| Dinoseb (6-sec-butyl-2,4-dinitrophenol)  | 88-85-7    | Toxic for reproduction  | R                  | EC 1907/2006/C  | Pesticide   |                            |
| Dioxobis(stearato)trilead  | 12578-12-0 | Toxic for reproduction  | R                  | EC 1907/2006/C  | Stabilizers for PVC, plastic goods  |                            |
| Dipentyl phthalate (DPP)   | 131-18-0   | Toxic for reproduction  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  | Laboratory chemical   | EU: sunset date 4/07/2020  |
| Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) | 573-58-0   | Carcinogenic  | R                  | EC 1907/2006/C  | Azo dyes  |                            |

| Substance   | CAS No.                                | Reason for inclusion                              | ABB classification | Legislation  | Example of applications  | Comments                   |
|---|--|---|--------------------|--|--|----------------------------|
| 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                              | Carcinogenic                                      | R                  | EC 1907/2006/C                                       | Azo dyes   |                            |
| Disodium octaborate   | 12008-41-2                             | Toxic for reproduction                            | R                  | EC 1907/2006/C                                       | Used in anti-freeze products, heat transfer fluids, lubricants and greases, and washing and cleaning products                            |                            |
| Disodium tetraborate, anhydrous   | 1330-43-4,<br>1303-96-4,<br>12179-04-3 | Toxic for reproduction                            | R                  | EC 1907/2006/C                                       | Used as wood preservative, flame retardant etc. Can be used in treated wood and flame-proof insulation.                                  |                            |
| Dodecamethylcyclohexasiloxane (D6)  | 540-97-6                               | PBT;<br>vPvB                                      | R                  | EC 1907/2006/C                                       | Used in washing and cleaning products, polishes and waxes, cosmetics and personal care products  |                            |
| Ethylenediamine (EDA)   | 107-15-3                               | Respiratory sensitising properties - human health | R                  | EC 1907/2006/C                                       | Used in adhesives and sealants, coating products, fillers, putties, plasters, modelling clay, pH regulators and water treatment products |                            |
| Fatty acids, C16-18, lead salts   | 91031-62-8                             | Toxic for reproduction                            | R                  | EC 1907/2006/C                                       | Stabilizers for PVC, plastic goods   |                            |
| Formaldehyde, oligomeric reaction products with aniline   | 25214-70-4                             | Carcinogenic                                      | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>Can Tox. Subs. | Hardener for epoxy resins, for glue, paint and varnish.  | EU: sunset date 22/08/2017 |
| Formamide   | 75-12-7                                | Toxic for reproduction                            | R                  | EC 1907/2006/C                                       | Intermediate. Laboratory chemical  |                            |
| Furan   | 110-00-9                               | Carcinogenic                                      | R                  | EC 1907/2006/C<br>California Prop 65                 | Solvent  |                            |
| Henicosfluoroundecanoic acid  | 2058-94-8                              | vPvB  | R                  | EC 1907/2006/C                                       | Used in the production of fluoropolymers   |                            |

| Substance   | CAS No.  | Reason for inclusion  | ABB classification | Legislation   | Example of applications   | Comments                   |
|---|--|---|--------------------|---|---|----------------------------|
| Heptacosafuorotetradecanoic acid  | 376-06-7   | vPvB  | R                  | EC 1907/2006/C  | Used in the production of fluoropolymers  |                            |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (a - HBCDD, B-HBCDD, v-HBCDD)  | 3194-55-6,<br>134237-52-8,<br>134237-50-6,<br>134237-51-7,<br>25637-99-4 | PBT   | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV                                    | Used as flame retardant in the plastics industry, mainly in polystyrene. Used as an additive flame retardant primarily in expanded polystyrene (EPS) and extruded polystyrene (XPS), used as insulating materials in the construction industry. | EU: sunset date 21/08/2015 |
| Hexahydromethylphthalic anhydride [1],<br>Hexahydro-4-methylphthalic anhydride [2],<br>Hexahydro-1-methylphthalic anhydride [3],<br>Hexahydro-3-methylphthalic anhydride [4].<br>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 | 25550-51-0,<br>19438-60-9,<br>48122-14-1,<br>57110-29-9                  | Equivalent level of concern having probable serious effects to human health | R                  | EC 1907/2006/C  | Motor insulation, hardener for epoxy resin  |                            |
| Hydrazine   | 302-01-2,<br>7803-57-8   | Carcinogenic  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California Prop 65 | Corrosion inhibitor in cooling systems.   |                            |
| Imidazolidine-2-thione (2-imidazoline-2-thiol)  | 96-45-7  | Toxic for reproduction  | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>US 40 CFR Ch<br>California Prop 65 | Used in rubber manufacturing  |                            |
| Lead  | 7439-92-1  | Toxic for reproduction  | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII                                   | Used in metals, welding and soldering products, metal surface treatment products, and polymers.   |                            |

| Substance   | CAS No.           | Reason for inclusion  | ABB classification | Legislation  | Example of applications  | Comments  |
|---|-------------------|---|--------------------|--|--|---|
| Lead and lead compounds                                     | 7439-92-1<br>(Pb) | Acute toxicity;<br>Serious health hazard;<br>Hazardous to the environment | P                  | R<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>2011/65/EU<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch | Electric and electronic equipment covered by RoHS  | P in packaging; completely banned in paints (lead carbonate and sulphates). R in all other applications.<br>EU: P in all applications covered by RoHS.<br>FR: P in in non-removable batteries and accumulators. Limit value, 0.4% w/w.<br>CH: P - in non-removable batteries, limit value: 0.1% w/W; - in wood-based materials, limit value: 0.009% w/w;<br>- in packaging, limit value: 0.01% w/w. |
| Lead bis(tetrafluoroborate)                                 | 13814-96-5        | Toxic for reproduction  |                    | R<br>EC 1907/2006/C  | Surface treatment, electroplating, laboratory chemical   |   |
| Lead chromate   | 7758-97-6         | Carcinogenic;<br>Toxic for reproduction                                   | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CH SR 814.81 A2<br>2011/65/EU<br>CAN NPRI 2010<br>CAN Tox. Subs.     | Dyes and pigments.<br>Corrosion protection.<br>Electric and electronic equipment covered by RoHS | EU: sunset date 21/05/2015  |
| Lead chromate molybdate sulphate red (C.I. Pigment Red 104) | 12656-85-8        | Carcinogenic;<br>Toxic for reproduction                                   | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CH SR 814.81 A2<br>CAN NPRI 2010<br>CAN Tox. Subs.                   | Dyes and pigments,<br>Corrosion protection   | EU: sunset date 21/05/2015,<br>P in all applications.<br>CH: P in packaging, limit value 0.01% w/w.   |
| Lead cyanamidate  | 20837-86-9        | Toxic for reproduction  |                    | R<br>EC 1907/2006/C  |  |   |
| Lead di(acetate)  | 301-04-2          | Toxic for reproduction  |                    | R<br>EC 1907/2006/C<br>California Prop 65  | Laboratory Chemical, in color, paint strippers and thinners                                      |   |

| Substance  | CAS No.    | Reason for inclusion                    | ABB classification | Legislation   | Example of applications  | Comments  |
|--|------------|---|--------------------|---|--|---|
| Lead diazide, Lead azide                           | 13424-46-9 | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Mainly used as initiator or booster in detonators for both civilian and military uses and as initiator in pyrotechnic devices.   |   |
| Lead dinitrate                                     | 10099-74-8 | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Stabilizers for PVC, plastic goods   |   |
| Lead dipicrate                                     | 6477-64-1  | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Lead dipicrate is an explosive like lead diazide and lead styphnate.   |   |
| Lead hydrogen arsenate                             | 7784-40-9  | Carcinogenic;<br>Toxic for reproduction | P                  | R<br>EC 1907/2006/C<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>CAN NPRI 2010            | Has previously been used as pesticide.   | R in all applications.<br>CH: P - in non-removable batteries, Limit value: 0.1% w/w;<br>- in packaging, limit value: 0.01% w/w. |
| Lead monoxide (lead oxide)                         | 1317-36-8  | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Stabilizers, pigments, raw material for glass and ceramics manufacturing   |   |
| Lead oxide sulfate                                 | 12036-76-9 | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Stabilizers for PVC, plastic goods   |   |
| Lead styphnate                                     | 15245-44-0 | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Mainly used as a primer for small caliber and rifle ammunition. Other common uses are in munition pyrotechnics, powder actuated devices and detonators for civilian use. |   |
| Lead sulfochromate yellow (C.I. Pigment Yellow 34) | 1344-37-2  | Carcinogenic;<br>Toxic for reproduction | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CH SR 814.81 A2<br>CAN NPRI 2010<br>CAN Tox. Subs | Dyes and pigments.<br>Corrosion protection.  | EU: sunset date 21/05/2015,<br>P in all applications.<br>CH: P in packaging, limit value 0.01% w/w.                             |
| Lead titanium trioxide                             | 12060-00-3 | Toxic for reproduction                  | R                  | EC 1907/2006/C  | Semiconductors, computers, electrical and optical products   |   |

| Substance  | CAS No.   | Reason for inclusion  | ABB classification | Legislation  | Example of applications  | Comments   |
|--|---|---|--------------------|--|--|--|
| Lead titanium zirconium oxide                                  | 12626-81-2  | Toxic for reproduction  | R                  | EC 1907/2006/C   | Electronic products  |  |
| Lead(II) bis(methanesulfonate)                                 | 17570-76-2  | Toxic for reproduction  | R                  | EC 1907/2006/C   | Surface coating in the manufacture of electronic components such as circuit boards |  |
| Mercury and mercury compounds                                  | 7439-97-6 (Hg)                                      | Acute toxicity; Hazardous to the environment; Serious health hazard | P R                | EC 1907/2006/XVII<br>CH SR 814.81 A1<br>CH SR 814.81 A2<br>2011/65/EU<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch | Mercury and mercury compounds Electric and electronic equipment covered by RoHS    | P in anti fouling, wood preservation, textiles, water treatment and in batteries and accumulators; 2% w/w in button cells.<br>R in all other applications.<br>EU: P in all applications covered by RoHS.<br>CH: P in all applications except certain types of EEE.<br>Limit value: 0.0005% w/w.<br>- in portable batteries; 2% w/w,<br>- in button cells; 0.01% w/w<br>- in packaging; 0.0025% w/w<br>- in wood-based materials;<br>- in EEE 0.1% w/w. |
| Methanediisocyanate (MDI)                                      | 101-68-8,<br>2536-05-2,<br>5873-54-1,<br>26447-40-5 | Serious health hazard   | R                  | EC 1907/2006/XVII,   | PUR-foam, adhesives  |  |
| Methoxyacetic acid   | 625-45-6  | Toxic for reproduction  | R                  | EC 1907/2006/C   | Lime remover   |  |
| Methyloxirane (Propylene oxide)                                | 75-56-9   | Carcinogenic; Mutagenic   | R                  | EC 1907/2006/C<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65                                  | For surfactants  |  |
| N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base) | 101-61-1  | Carcinogenic  | R                  | EC 1907/2006/C<br>California Prop 65   | Laboratory chemicals, paper goods, ink   |  |
| N,N-dimethylacetamide  | 127-19-5  | Toxic for reproduction  | R                  | EC 1907/2006/C<br>California Prop 65   | May occur in surface treatment, sealants etc.                                      |  |

| Substance  | CAS No.                        | Reason for inclusion   | ABB classification | Legislation   | Example of applications  | Comments                  |
|--|--------------------------------|--|--------------------|---|--|---------------------------|
| N,N-dimethylformamide  | 68-12-2                        | Toxic for reproduction   | R                  | EC 1907/2006/C  | Solvents, laboratory chemical  |                           |
| N-methylacetamide  | 79-16-3                        | Toxic for reproduction   | R                  | EC 1907/2006/C  | Laboratory chemical  |                           |
| Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts | 335-76-2, 3830-45-3, 3108-42-7 | Toxic for reproduction<br>PBT  | R                  | EC 1907/2006/C  | Lubricant, wetting agent, plasticisers   |                           |
| Nonylphenol (4-Nonylphenol, branched and linear)                     | 25154-52-3, 84852-15-3         | Toxic for reproduction;<br>Hazardous for the environment                   | R                  | EC 1907/2006/XVII<br>CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs. 2001/838/EC | Corrosion inhibitor  |                           |
| Nonylphenoethoxylate   | 9016-45-9                      | Health hazard;<br>Hazardous to aquatic organisms                           | R                  | EC 1907/2006/XVII<br>CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs. 2001/838/EC | Cleaning agent   |                           |
| N-pentyl-isopentylphthalate  | 776297-69-9                    | Toxic for reproduction   | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV  |  | EU: sunset date 4/07/2020 |
| o-aminoazotoluene  | 97-56-3                        | Carcinogenic   | R                  | EC 1907/2006/C<br>California Prop 65  | Dyes, pigments, textile, intermediate for dyes   |                           |
| Octamethylcyclotetrasiloxane (D4)                                    | 556-67-2                       | PBT;<br>vPvB   | R                  | EC 1907/2006/C  | Used in washing and cleaning products, polishes and waxes and cosmetics and personal care products |                           |
| Orange lead (lead tetroxide)   | 1314-41-6                      | Toxic for reproduction   | R                  | EC 1907/2006/C  | Pigments, stabilizers, lead acid batteries, glass and ceramics, rubber and plastic products        |                           |
| p-(1,1-dimethylpropyl)phenol   | 80-46-6                        | Equivalent level of concern having probable serious effects to environment | R                  | EC 1907/2006/C  | Manufacture of chemicals and plastic products  |                           |
| Pentacosafuorotridecanoic acid                                       | 72629-94-8                     | vPvB   | R                  | EC 1907/2006/C  |  |                           |

| Substance   | CAS No.                               | Reason for inclusion          | ABB classification | Legislation                          | Example of applications   | Comments                   |
|---|---------------------------------------|-------------------------------|--------------------|--------------------------------------|---|----------------------------|
| Pentadecafluorooctanoic acid (PFOA)                         | 335-67-1                              | Toxic for reproduction        | R                  | EC 1907/2006/C                       | Surfactant in the emulsion polymerization of fluoropolymers.  |                            |
| Pentalead tetraoxide sulphate                               | 12065-90-6                            | Toxic for reproduction        | R                  | EC 1907/2006/C                       | Plastic products, lead acid batteries, stabilizers for PVC  |                            |
| Pentazinc chromate octahydroxide                            | 49663-84-5                            | Carcinogenic                  | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV   | Used for surface treatment and as pigment in paint.   | EU: sunset date 22/01/2019 |
| Perfluorohexane-1-sulphonic acid and its salts (PFHxS)      | -                                     | vPvB                          | R                  | EC 1907/2006/C                       | May be used as a plasticiser, lubricant, surfactant, wetting agent, corrosion inhibitor and in fire-fighting foams  |                            |
| Perfluorononan-1-oic-acid and its sodium and ammonium salts | 375-95-1,<br>21049-39-8,<br>4149-60-4 | Toxic for reproduction, PBT   | R                  | EC 1907/2006/C                       | Processing aid for fluoropolymer manufacture/lubricating oil additive/surfactant for fire extinguishers/cleaning agent/textile antifouling finishing agent/polishing surfactant/waterproofing agents and in liquid crystal display panels |                            |
| Phenolphthalein   | 77-09-8                               | Carcinogenic                  | R                  | EC 1907/2006/C<br>California Prop 65 | Used in labs as pH-indicator and may occur as corrosion inhibitor.  |                            |
| Phthalato(2-)dioxotrilead                                   | 69011-06-9                            | Toxic for reproduction        | R                  | EC 1907/2006/C                       | Stabilizers for PVC, rubber products, plastic products  |                            |
| Pitch, coal tar, high temp.                                 | 65996-93-2                            | Carcinogenic;<br>PBT;<br>vPvB | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV   | Used in manufacture of anthracene and carbon black. Corrosion protection.   | EU: sunset date 4/10/2020  |

| Substance  | CAS No.  | Reason for inclusion                                  | ABB classification |   | Legislation   | Example of applications   | Comments  |
|--|--|---|--------------------|---|---|---|---|
| Polybrominated diphenyl-ethers (PBDE) Polybrominated biphenyls (PBB) (di-, tetra-, hexa-, octa-, decabromobiphenyl)  | 92-86-4,<br>60044-25-9,<br>36355-01-8,<br>59536-65-1,<br>27858-07-7,<br>13654-09-6 | PBT;<br>vPvB  | P                  | R | EC 1907/2006/XVII<br>2011/65/EU<br>CH SR 814.81 A1<br>EC 850/2004<br>CAN Tox. Subs.     | Electric and electronic equipment                                   | EU: P in all applications covered by RoHS.<br>CH: P in packaging, limit value: 0.01% w/w. |
| Polychlorinated biphenyl (PCB)   | 1336-36-3  | Health hazard;<br>Acute toxicity to aquatic organisms | P                  |   | CH SR 814.81 A2<br>EC 850/2004<br>CAN Tox. Subs.<br>US 40 CFR Ch 91/339/EEC<br>96/59/EC | Transformers & capacitors   |   |
| Potassium chromate   | 7789-00-6  | Carcinogenic;<br>Mutagenic                            | P                  |   | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs.                   | Surface coating of metals.  | EU: sunset date 21/09/2017  |
| Potassium dichromate   | 7778-50-9  | Carcinogenic;<br>Mutagenic;<br>Toxic for reproduction | P                  |   | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs.                   | Surface coating of metals.  | EU: sunset date 21/09/2017  |
| Potassium hydroxyoctaoxodizincatedi-chromate   | 11103-86-9   | Carcinogenic  |                    | R | EC 1907/2006/C<br>EC 1907/2006/XIV  | Surface coating of metals   | EU: sunset date 22/01/2019  |
| Pyrochlore, antimony lead yellow   | 8012-00-8  | Toxic for reproduction                                |                    | R | EC 1907/2006/C  | Dye, pigment, ink toner   |   |
| 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) | See note 4 in "Notes"  | Toxic for reproduction                                |                    | R | EC 1907/2006/C  | Might be used as heat stabilizer in plastic (mainly PVC processing) |   |

| Substance  | CAS No.                | Reason for inclusion                            | ABB classification | Legislation   | Example of applications  | Comments                   |
|--|------------------------|---|--------------------|---|--|----------------------------|
| 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] | -                      | Endocrine disrupting properties environment     | R                  | EC 1907/2006/C  | Used as a lubricant additive in lubricants and greases.  |                            |
| Silicic acid (H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ), barium salt (1:1), lead-doped   | 68784-75-8             | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Paint, coating in light-bulbs  |                            |
| Silicic acid, lead salt  | 11120-22-2             | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Glass and ceramic products   |                            |
| Sodium chromate  | 7775-11-3              | Carcinogenic; Mutagenic; Toxic for reproduction | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs. | Laboratory chemical  | EU: sunset date 21/09/2017 |
| Sodium dichromate (anhydrous and dihydrate)  | 7789-12-0, 10588-01-9  | Carcinogenic; Mutagenic; Toxic for reproduction | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs. | Surface treatment of metal and electroplating products.  | EU: sunset date 21/09/2017 |
| Sodium perborate; perboric acid, sodium salt   | 15120-21-5, 11138-47-9 | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Bleach in laundry and dishwasher detergents  |                            |
| Sodium peroxometaborate  | 7632-04-4              | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Bleach in laundry and dishwasher detergents  |                            |
| Strontium chromate   | 7789-06-2              | Carcinogenic                                    | R                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>CAN NPRI 2010<br>CAN Tox. Subs. | Corrosion protection in pigment of paints and varnish.   | EU: sunset date 22/01/2019 |
| Sulfurous acid, lead salt, dibasic   | 62229-08-7             | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Stabilizers for PVC, plastic goods   |                            |
| Terphenyl hydrogenated   | 61788-32-7             | vPvB  | R                  | EC 1907/2006/C  | Used as a plastic additive, solvent, in coatings/inks, in adhesives and sealants, and heat transfer fluids |                            |
| Tetraboron disodium heptaoxide, hydrate  | 12267-73-1             | Toxic for reproduction                          | R                  | EC 1907/2006/C  | Used as wood preservatives, flame retardants etc. Can be used in treated wood and flame-proof insulation.  |                            |

| Substance                                 | CAS No.    | Reason for inclusion   | ABB classification | Legislation   | Example of applications   | Comments |
|---|------------|--|--------------------|---|---|----------|
| Tetrachloroethene (perchloroethylene)     | 127-18-4   | Carcinogenic; Hazardous to aquatic organisms   | P                  | CH SR 814.81 A1<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch 90/415/EEC<br>EC 2037/2000<br>96/55/EC<br>California Prop 65 | Degreasing  |          |
| Tetrachloromethane (carbon tetrachloride) | 56-23-5    | Acute toxicity; Hazardous to the environment; Substance that deplete the ozone layer | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch<br>California Prop 65     | Degreasing  |          |
| Tetraethyllead                            | 78-00-2    | Toxic for reproduction   | R                  | EC 1907/2006/C  | Fuel  |          |
| Tetrafluoromethane (CF4)                  | 75-73-0    | Greenhouse gas   | R                  | 1999/296/EC<br>EU 517/2004  | Semiconductor manufacturing (additives to SF6 excluded)                 |          |
| Tetralead trioxide sulphate               | 12202-17-4 | Toxic for reproduction   | R                  | EC 1907/2006/C  | Paints, varnishes, PVC stabilizers, plastic products, lead acid battery |          |
| Trichlorofluoromethane (CFC-11)           | 75-69-4    | Substance that deplete the ozone layer   | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2, EC<br>2037/2000<br>CAN Tox. Subs.<br>US 40 CFR Ch   | Cooling agent   |          |
| Tricosafuorododecanoic acid               | 307-55-1   | vPvB   | R                  | EC 1907/2006/C  |   |          |
| Triethyl arsenate                         | 15606-95-8 | Carcinogenic   | R                  | EC 1907/2006/C  | May occur in the electronics industry in integrated circuits.           |          |

| Substance   | CAS No.    | Reason for inclusion   | ABB classification | Legislation   | Example of applications  | Comments                   |
|---|------------|--|--------------------|---|--|----------------------------|
| Trifluorobromomethane (Halon-1301)  | 75-63-8    | Substance that deplete the ozone layer                       | P                  | CH SR 814.81 A1<br>CH SR 814.81 A2<br>EC 2037/2000<br>CAN NPRI 2010<br>CAN Tox. Subs.<br>US 40 CFR Ch | Fire extinguisher  |                            |
| Trilead bis(carbonate) dihydroxide  | 1319-46-6  | Toxic for reproduction                                       | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII<br>CH SR 814.81 A2<br>CAN NPRI 2010                               | Pigment in colour, Ceramic materials, oil paintings  |                            |
| Trilead diarsenate  | 3687-31-8  | Carcinogenic and toxic for reproduction                      | R                  | EC 1907/2006/C<br>EC 1907/2006/XVII   | Present in complex raw materials imported for manufacture of copper, lead and a range of precious metals.  |                            |
| Trilead dioxide phosphonate   | 12141-20-7 | Toxic for reproduction                                       | R                  | EC 1907/2006/C  | Stabilizers  |                            |
| Tris(2-chloroethyl)phosphate  | 115-96-8   | Toxic for reproduction                                       | P                  | EC 1907/2006/C<br>EC 1907/2006/XIV<br>Can Tox. Subs.<br>California Prop 65                            | Additive flame retardant for plastics. Flame-retardant paints lacquers and adhesives.  | EU: sunset date 21/08/2015 |
| Trixylyl phosphate  | 25155-23-1 | Toxic for reproduction                                       | R                  | EC 1907/2006/C  | In lubricants  |                            |
| Zinc chromate   | 13530-65-9 | Carcinogenic;<br>Hazardous to the environment;<br>Allergenic | R                  | CAN NPRI 2010<br>CAN Tox. Subs.   | Surface treatment.<br>Pigment in e.g. paint.   |                            |
| Zirconia Aluminosilicate Refractory Ceramic Fibres  |            | Carcinogenic   | R                  | EC 1907/2006/C<br>CAN Tox. Subs.  | Insulation materials for industrial use. Fire protection in industrial equipment.  |                            |
| $\alpha,\alpha$ -Bis[4-(dimethylamino)phenyl]-4-(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2) | 6786-83-0  | Carcinogenic   | R                  | EC 1907/2006/C  | Ink. Dyeing of paper, packaging materials textiles and plastic products. Washer fluid. Paper products, packaging materials, textiles and plastics. |                            |



## Notes

### Note 1.

4-Nonylphenol, branched and linear - Non-exhaustive list of substances covered by the group entry

Substance name: 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]

<http://echa.europa.eu/documents/10162/3024c102-20c9-4973-8f4e-7fc1dd361e7d>

| Substance                               | CAS No      |
|---|-------------|
| Phenol, 4- nonyl-, branched             | 84852-15-3  |
| Phenol, 4-isononyl-                     | 26543-97-5  |
| Phenol, 4-nonyl-                        | 104-40-5    |
| Phenol, 4-(1-methyloctyl)-              | 17404-66-9  |
| Phenol, 4-(1,1-dimethylheptyl)-         | 30784-30-6  |
| Phenol, 4-(1-ethyl-1-methylhexyl)-      | 52427-13-1  |
| Phenol, 4-(1-ethyl-1,3-dimethylpentyl)- | 186825-36-5 |
| Phenol, 4-(1-ethyl-1,4-dimethylpentyl)- | 142731-63-3 |

### Note 2.

4-Nonylphenol, branched and linear, ethoxylated - Non-exhaustive list of substances covered by the group entry

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

<https://echa.europa.eu/documents/10162/38d2e3f0-2449-4767-97a4-6b5f5db56aef>

| Substance   | CAS No      |
|---|-------------|
| 4-Nonyl Phenol Monoethoxylate   | 104-35-8    |
| Poly(oxy-1,2-ethanediyl), $\alpha$ -(4-nonylphenyl)- $\omega$ -hydroxy- | 26027-38-3  |
| Ethanol, 2-[2-[2-[2-(4-nonylphenoxy)ethoxy]ethoxy]ethoxy]-              | 7311-27-5   |
| Ethanol, 2-[2-(4-nonylphenoxy)ethoxy]-                                  | 20427-84-3  |
| 3,6,9,12,15-Pentaoxaheptadecan-1-ol,17-(4-nonylphenoxy)-                | 34166-38-6  |
| 3,6,9,12,15,18-Hexaoxaeicosan-1-ol, 20-(4-nonylphenoxy)-                | 27942-27-4  |
| 3,6,9,12,15,18,21,24-Octaoxahexacosan-1-ol, 26-(4-nonylphenoxy)-        | 14409-72-4  |
| Isononylphenol, ethoxylated   | 37205-87-1  |
| 4-Nonylphenol, branched, ethoxylated                                    | 127087-87-0 |
| Ethanol,2-[2-(4-tert-nonylphenoxy)ethoxy]- (9CI)                        | 156609-10-8 |

### Note 3.

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]

<http://echa.europa.eu/documents/10162/a4fac134-09e6-43c1-a65f-dfaee5f85731>

#### Note 4.

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)

<http://echa.europa.eu/documents/10162/a410b50c-11f9-49ca-9e8f-54f2a674b032>

#### Note 5.

Threshold values for cadmium and cadmium compounds

R in all applications

EU: P - as pigment in polymer materials and paints, except for safety reasons;

- as stabilizer in mixtures or articles manufactured from polymers or copolymers of vinyl chloride, except for safety reasons. Limit value: 0.01 % w/w.
- in EEE, limit value: 0.01% w/w.

France: P - in portable batteries, limit value: 0.002 % w/w;

- in zinc-carbon batteries, limit value: 0.015% w/w.

Germany: P as coating of metal surfaces, except to ensure functional reliability.

CH: P - in portable batteries, including those contained in appliances, limit value: 0.2% w/w;

- in plastics, limit value 0.01% w/w;
- in paints, limit value: 0.01% w/w,
- in paint with high zinc content 0.1% w/w;
- as coating of metal surfaces, except to ensure functional reliability;
- in zinc-plated articles, limit value: 0.025% w/w; in packaging, limit value: 0.01% w/w;
- in wood based materials, limit value: 0.005% w/w;
- in EEE, limit value: 0.01% w/w.

#### Note 6.

Chrome (VI) and compounds containing Cr(VI)

IEC62474 considers the following Cr(VI) compounds:

Barium chromate CAS number 10294-40-3, Calcium chromate CAS number 13765-19-0, Chromium trioxide CAS number 1333-82-0, Sodium chromate CAS number 7775-11-3, Sodium dichromate CAS number 10588-01-9, Strontium chromate CAS number 7789-06-2, Potassium dichromate CAS number 7778-50-9, Potassium chromate CAS number 7789-00-6 and Zinc chromate CAS number 13530-65-9.

#### Reference list

2011/65/EC corresponds to Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

2009/251/EC corresponds to Commission decision of 17 March 2009 requiring Member States to ensure their products containing the biocide dimethylfurfate are not placed or made available on the market.

EC 1907/2006/C corresponds to Regulation No 1907/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): Candidate list

EC 1907/2006/XIV corresponds to Regulation No 1907/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): Annex XIV

EC 1907/2006/XVII corresponds to Regulation No 1907/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): Annex XVII

EU 517/2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006

2005/84/EC corresponds to Directive 2005/84/EC of the European Parliament and of the Council of 14 December 2005 amending for the 22nd time Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (phthalates in toys and childcare articles).

EC 850/2004 corresponds to Regulation No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants amending Directive 79/117/EC.

2001/838/EC corresponds to: Commission Recommendation of 7 November 2001 on the results of the risk evaluation and the risk reduction strategies for the substances: acrylaldehyde; dimethyl sulphate; nonylphenol phenol, 4-nonyl-, branched; tert-butyl methyl ether; 2001/838/EC

2001/852/EC corresponds to Commission Decision of 19 November 2001 on adopting Community import decisions pursuant to Council Regulation (EEC) no 2455/92 concerning the export and import of certain dangerous chemicals and amending Decision 2000/657/EC.

EC 2037/2000 corresponds to Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer

1999/721/EC corresponds to Commission recommendation of 12 October 1999 on the results of the risk evaluation and on the risk reduction strategies for the substances: 2-(2-butoxyethoxy)ethanol; 2-(2-methoxyethoxy)ethanol; Alkanes, C10-13, chloro; Benzene, C10-13-alkyl derivs.

1999/296/EC corresponds to Council Decision of 26 April 1999 amending Decision 93/389/EEC for a monitoring mechanism of Community CO<sub>2</sub> and other greenhouse gas emissions

96/59/EC corresponds to Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)

96/55/EC corresponds to Commission Directive 96/55/EC of 4 September 1996 adapting to technical progress for the 2nd time Annex I to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (chlorinated solvents)

91/339/EC corresponds to Council Directive 91/339/EEC of 18 June 1991 amending for the 11th time Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations

90/415/EC corresponds to Council Directive 90/415/EEC of 27 July 1990 amending Annex II to Directive 86/280/EEC on limit values and quality objectives for discharges of certain dangerous substances included in list I of the Annex to Directive 76/464/EEC

CH SR 814.81 A1 corresponds to SR 814.81 Ordinance on the Reduction of Risks relating to the Use of Certain Particularly Dangerous Substances, Preparations and Articles (Chemical Risk Reduction Ordinance, ORRChem) of 18 May 2005 - Annex 1 Provisions relating to specific substances. (Switzerland)

CH SR 814.81 A2 corresponds to 814.81 Ordinance on the Reduction of Risks relating to the Use of Certain Particularly Dangerous Substances, Preparations and Articles (Chemical Risk Reduction Ordinance, ORRChem) of 18 May 2005 - Annex 2 Provisions relating to groups of preparations and articles. (Switzerland)

CAN NPRI 2010 corresponds to Canadian National Pollutant Release Inventory changes in reporting requirements for 2010 (Canada)

CAN Tox. Subs. corresponds to Canadian Toxic Substances List - Schedule 1. (Canada)

FR ECA R521-4 to 42 corresponds to France Environment Code Article R521-4 to 42.

US 40 CFR Ch corresponds to US Environmental Protection Agency, Public Information Regulations, CFR Title 40 - Protection of Environment

California Prop 65 corresponds to Proposition 65, formally titled "The Safe Drinking Water and Toxic Enforcement Act".

## Version history

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