More information about Safe Work Australia’s review of Workplace Exposure Standards can be found at [go.aigroup.com.au/wesreview](http://go.aigroup.com.au/wesreview)

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Evaluation Reports for the review of WES vary in their detail. In many of the reports, a brief description is provided about where and how the substances are used or produced. Where this information has been provided, it has been inserted into the following tables.

**Release 1**

Release 1 related to Respirable Crystalline Silica (RCS) and Respirable Coal Dust (RCD). The evaluation of these WES was fast-tracked due to there being an increasing number of diagnosed cases of accelerated silicosis (in the engineered stone industry) and black coal pneumoconiosis (amongst miners).

Safe Work Australia has now advised that Work Health and Safety (WHS) ministers have agreed by the requisite majority to ***reduce*** the workplace exposure standards (WES) for respirable coal dust and respirable crystalline silica.

Respirable coal dust will be reduced to an 8-hour time weighted average (TWA) of 1.5 mg/m3, with effect from 1 October 2022, allowing for a three-year transitional period).

Respirable crystalline silica will be reduced to a TWA of 0.05 mg/m3, as soon as practicable; it will be up to individual governments to implement this change into jurisdictional WHS laws.

**Note: Each release is listed alphabetically. However, due to some chemical assessments being delayed, it is not a pure alphabetical list throughout. If searching for a particular chemical, it is best to search electronically.**

**Release 2**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Acetaldehyde  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetaldehyde is primarily used as a substrate in acetic acid manufacture and in a range of processing areas such as leather tanning and mirror silvering. |
| Acetic acid  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetic acid is used in the production of pharmaceuticals, plastics, insecticides and dyes and as a food additive (vinegar). |
| Acetic anhydride  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetic anhydride is primarily used in the manufacturing of cellulose acetates and in pharmaceutical production as a dehydrating and acetylating agent. |
| Acetone  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetone is used extensively as an industrial solvent for resins, fats, oils, dyes and gum waxes and is often incorporated into plastics, varnishes and paints. |
| Acetonitrile  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetonitrile is primarily used as a solvent in hydrocarbon extraction processes and in processing vegetable oils to remove fatty acids. |
| Acetylsalicylic acid  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acetylsalicylic acid is widely used as an analgesic, anti-inflammatory agent and as an anticoagulant in human and veterinary medicine. |
| Acrolein  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acrolein is used as an intermediate in the production of polyurethane, polyester resins and pharmaceuticals. It is also used in the production of herbicides and as a tear gas. |
| Acrylamide  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acrylamide is primarily used as a polymer or copolymer in a range of applications including fibres, paper sizing, adhesives and textiles. |
| Acrylic acid | Acrylic acid is used in many industries including plastics, adhesives, water treatment and textiles. |
| Acrylonitrile  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Acrylonitrile is primarily used as a monomer for acrylic and mod-acrylic fibres and in the production of nitrile rubbers. |
| Aldrin  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Aldrin has previously been used extensively as an insecticide but use has declined due to persistence in the environment and high fat solubility. |
| Allyl alcohol | Allyl alcohol is a precursor to many specialised compounds used in flame-resistant materials, drying oils and plasticisers. |
| Allyl chloride | Allyl chloride is used in manufacturing of polymers, resins, plastics and pharmaceutics. |
| Allyl glycidyl ether (AGE) | AGE is an organic compound used in adhesives and sealants and as a monomer for polymerisation reactions. |
| Allyl propyl disulphide | Allyl propyl disulfide is used as an additive and flavouring in food manufacturing and is a major component of onion oil. |
| Aluminium & compounds | Aluminium is naturally abundant and used in metal alloys and manufacturing. |
| 2-Aminopyridine | 2-Aminopyridine is used primarily in the pharmaceutical industry as an intermediate in chemical synthesis. |
| Amitrole | Amitrole is used as a herbicide and growth regulator for plants. |
| Ammonia | Ammonia is used as a fertiliser in ammoniated fertilisers. It is also used in the manufacture of nitric acid, hydrazine hydrate, hydrogen cyanide and acrylonitrile. Other applications of ammonia include its use as a refrigerant, as a condensation catalyst for polymers and it is also used in nitriding of steel. |
| Ammonium chloride | Ammonium chloride fumes are produced during industrial processes such as galvanising. |
| Ammonium perfluorooctanoate | Ammonium perfluorooctanoate (APFO) is an industrial surfactant in chemical processes and used in some feedstocks. |
| Ammonium sulphamate | Ammonium sulfamate is commonly used as a broad-spectrum herbicide |
| Amyl acetate (iso-, n- & sec- isomers) | Amyl acetates are commonly used as solvents, flavouring agents, and insecticides. |
| Aniline & homologues | Aniline is used in the manufacturing of polyurethane foams, pigments, dyes and pharmaceuticals |
| Anisidine (o-, p- isomers) | Anisidine is used as an intermediate in Azo dyestuff production and in laboratory testing. |
| Antimony & compounds | Antimony metal is used in batteries, solder, sheet and pipe metal, castings, semiconductors, and pewter. Antimony compounds are widely used in plastics, pigments, paper, paints, ceramics, ammunition and fireworks, and in some pharmaceuticals. |
| Antimony trioxide | Antimony trioxide (Sb2O3) is typically encountered in antimony processing, for which co-exposures to other antimony derivatives (e.g. elemental antimony, antimony trisulfide) exist |
| ANTU | ANTU is primarily a rodenticide. |
| Arsenic & soluble compounds | Arsenic is typically encountered as compounds in pesticides, starting materials for alloy and semiconductor production, and specialty glass production. |
| Arsine | Arsine is used in the semiconductor industry and in organoarsenic production. |
| Atrazine | Atrazine is a selective herbicide used for the control of grass and broadleaf weeds. |
| Azinphos-methyl | Azinphos-methyl is a broad-spectrum organophosphate insecticide |
| Barium sulfate | Barium sulfate is used for oil well drilling and is sourced from the mineral barite |
| Barium & soluble compounds | Barium compounds are used in ceramic applications and chemical manufacture |
| Benomyl | Benomyl is a systemic fungicide |
| Benzene  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Benzene is primarily used in the chemical industry in the production of plastics and a range of organic chemicals. |
| Benzidine | Benzidine has been used historically in dyes and its use in Australia is strictly controlled. |
| 1H-Benzotriazole | Benzotriazole is used primarily as a corrosion inhibitor, a UV stabiliser in plastics and in the pharmaceutical industry. |
| Benzoyl chloride | Benzoyl chloride is a by-product in the manufacture of α-chlorinated toluene derivatives |

**Release 3**

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| --- | --- | --- |
| **Substance** | | **Use as per descriptor in Evaluation Report**  **(when included)** |
| Benzoyl peroxide | Similar to other organic peroxides, benzoyl peroxide is used to generate reactive organic radicals for curing and finishing processes in the food, chemical and niche pharmaceutical industries. | |
| Benzyl chloride | Benzyl chloride is a reactive by-product of chemical manufacture and frequently presents as a mixture with dichlorotoluene and trichlorotoluene in technical-grade preparations. | |
| Beryllium & compounds | Beryllium is extensively used in electrodes, tools and in structural material for the aerospace industries. | |
| Biphenyl | Biphenyl is used mainly in the production of heat-transfer fluids and dye carriers. | |
| Bismuth telluride (incl. Se-Doped) | Bismuth telluride is used as a semiconductor and topological insulator. When alloyed (or doped) with selenium, it is used as a thermoelectric material for refrigeration and power generation. | |
| Bisphenol-A | Bisphenol A (BPA) is widely used in the manufacture of polycarbonate plastics and epoxy resins. | |
| Bisphenol A diglycidyl ether | Bisphenol A (BPA) is widely used in the manufacture of polycarbonate plastics and epoxy resins. | |
| Boron oxide | Boron oxides are commonly used in production of heat-resistant glass, fire retardant materials and uses in the electronics industry. | |
| Bromine pentafluoride | Bromine pentafluoride is used as a fluorinating agent in the production of fluorocarbons. | |
| Bromoform | Bromoform is used as a chemical intermediate, in the synthesis of pharmaceuticals and a solvent for waxes, greases and oils. | |
| 1-Bromopropane | 1-Bromopropane is used as a solvent to clean metals and electronics. | |
| 2-Butoxyethanol | 2-Butoxyethanol is used in various hard-surface cleaning products, cosmetic products and hair dyes and colours. It is also used as a solvent in water and organic solvent-based coatings. | |
| Butyl acetate | Butyl acetates are encountered as solvents in the production of photographic films, lacquers and cosmetics. | |
| n-Butyl alcohol | n-Butyl alcohol is used as a solvent in the food industry, cosmetics, gums, dyes, paints and in hydraulic fluids. | |
| tert-Butyl chromate (as CrO3) | Tert-butyl chromate is primarily used in specialty reactions as an organic source of chromium. | |
| Butyl mercaptan | Butyl mercaptan is typically used as a solvent and an intermediate in pesticide production. | |
| But-2-yne-1,4-diol | But-2-yne-1,4-Diol is predominantly used as an intermediate in the synthesis of butanediol and butenediol. | |
| Calcium hydroxide | The major use of calcium hydroxide is in mortar, plaster, cement and other building materials. | |
| Calcium silicate | Calcium silicate is used by consumers, in cosmetic and personal care products, formulation, repackaging and manufacturing. | |
| Calcium sulphate | Calcium sulfate is used in cement, wall plaster and gypsum wall board and as a paper filler. | |

**Release 4**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
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| Bitumen fumes | Bitumen is a black or brown solid or viscous liquid that is taken from distillation of crude petroleum oil. It is a complex mixture of chemicals, determined by the crude source, the refining process and application. Heated asphalts release vapours that condense upon cooling, termed asphalt or bitumen fumes. |
| Borates compounds | Anhydrous borates are commonly used in the glass industry and as an algicide. Pentahydrate and decahydrate forms are used mostly in herbicides and household cleaning products. Boric acid is commonly used as a pesticide. |
| Boron tribromide | Boron tribromide is used in the electronics industry for plasma etching in semiconductor device manufacturing and as a catalyst in the manufacture of high purity boron. |
| Boron trifluoride | Boron trifluoride is commonly used for catalytic alkylation reactions (isomerisation in petroleum cracking), applications for soldering flux and as a fumigant. |
| Bromacil | Bromacil is a non-selective herbicide used for general weed and brush control and in the production of citrus and pineapple. |
| Bromine | Bromine is used in chemical manufacture, organic syntheses, water purification, fumigant production and analytical reagents. |
| 1,3-Butadiene | 1,3-Butadiene is primarily used as a chemical intermediate in manufacturing synthetic rubbers. |
| Butane | Butane gas is generally encountered as an isomeric mixture of *n*-butane and isobutane. It is commonly used as aerosol propellants, fuel sources and in the manufacturing of rubber, plastic, resins and polyurethane foams; also abused to produce inebriation (ACGIH, 2018). |
| 2-Butoxyethyl acetate | 2-Butoxyethyl acetate is primarily used as a solvent for nitrocellulose lacquers, epoxy resins and multicolour lacquers. |
| n-Butyl acrylate | n-Butyl acrylate is used in the production of chemical polymers and resins for textile and leather finishes. It is also found in inks, toners and adhesive coating materials and paints. |
| sec-Butyl alcohol | sec-Butyl alcohol is used as an intermediate in methyl ethyl ketone (MEK) and perfume production, as a solvent and in hydraulic brake fluid. |
| tert-Butyl alcohol | tert-Butyl alcohol is used in industrial synthesis, as a dehydrating agent, as a chemical intermediate and solvent in pharmaceutical manufacture, denaturant for ethanol and antiknock agent. |
| n-Butyl glycidyl ether (BGE) | n-Butyl glycidyl ether (BGE) is used as a reactive diluent in epoxy resins, which are used in a range of industrial, construction and domestic uses. |
| n-Butyl lactate | n-Butyl lactate is typically encountered as a solvent for processing cellulose derivatives, natural gums, oils, dyes, paints and polymers. |
| Butylamine | n-Butylamine is commonly used as an intermediate for pharmaceuticals, dyes, insecticides, emulsifying and synthetic tanning agents and rubber chemicals. |
| o-sec-Butylphenol | O-sec-butylphenol is used as a chemical intermediate in resins, plasticisers and surface-active agents. Phenols and cresols are considered similar analogues for toxicity. |
| p-tert-Butyltoluene | p-tert-Butyltoluene is used as an intermediate in the production of tert-butyl benzoic acid which is ultimately used in the manufacturing of unsaturated polyesters and other products. |
| γ-Butyrolactone (gamma) | Gamma-butyrolactone (GBL) is used as a solvent, an additive in drilling oils and chemical colour removers, a stabiliser for some pesticides and as a therapeutic sedative. |
| Cadmium and compounds  (as Cd) | Cadmium is a naturally occurring element that is primarily used as a coating for other metals and can be found in a range of consumer products. It is also recovered as a by-product during the refining of zinc, lead and copper. |
| Caesium hydroxide | Caesium hydroxide is a strong base commonly employed as a polymerisation catalyst in cyclic siloxane production and as an electrolyte in battery and photographic applications. |
| Calcium carbonate | Calcium carbonate is primarily used in the manufacture of quicklime and Portland cement. |
| Calcium cyanamide | Calcium cyanamide is primarily used as the raw material in the commercial manufacture of calcium cyanide and dicyanamide. |
| Calcium oxide | The major use of calcium oxide is in mortar, plaster, cement and other building and paving materials. |
| Camphor, synthetic | Synthetic camphor is primarily used as a plasticiser for cellulose esters and ethers which are in turn used in a range of industrial applications and processes. |
| Caprolactam (dust and vapour) (including e‑Captrolactam) | Caprolactam is primarily used as a monomer for synthetic fibres, plastics, coatings, plasticisers and paint vehicles and in polyurethanes. |
| Captafol | Captafol is used as a broad-spectrum fungicide for fruits, vegetables, ornamental plants and turf grasses. |
| Captan | Captan is used as a fungicide in agricultural and therapeutic applications. |
| Carbaryl | Carbaryl is used primarily as an insecticide, acaricide and molluscicide. |
| Carbofuran | Carbofuran is used primarily as an insecticide, acaricide and nematicide. |
| Carbon black | Carbon black is used primarily as a source of elemental carbon in chemical manufacture of rubber and pigments. |
| Carbon dioxide, including CO2 in coal mines | Carbon dioxide is produced in the body and has important physiological functions. It is also used as dry ice, a propellant in aerosols, carbonisation of beverages and in fire extinguishers. |
| Carbon disulphide  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Carbon disulphide is primarily used as a reactant to produce cellulose xanthate and in producing carbon tetrachloride and plywood adhesives. |
| Carbon monoxide  Use information not provided in Draft Evaluation Report. Supplementary information provided by SWA | Carbon monoxide is primarily encountered as a by-product of incomplete combustion in internal combustion engines. High concentrations of carbon monoxide are produced in the steel industry in blast furnace operation. |
| Carbon tetrabromide | Carbon tetrabromide is used as a chemical intermediate in organic synthesis. |
| Carbonyl fluoride | Carbonyl fluoride is used as a chemical intermediate in organic synthesis. |
| Cellulose (paper fibre) | Cellulose and starch are the two major carbohydrate polymers produced from plants. Plant fibres containing cellulose are ubiquitous in nature and are found in air, water, and food. |
| Chlordane | Chlordane is a contact pesticide that used for termite control, as an insecticide in homes and gardens and in corn and citrus production. |
| Chlorinated camphene | Technical grade mixtures (toxaphene) are used as a contact insecticide and comprise up to 670 chlorinated derivatives. |
| Chlorinated diphenyl oxide | Chlorinated diphenyl oxides are encountered as intermediates in chemical manufacture, corrosion inhibitors, dry-cleaning detergents, thermal lubricants, and as additives for soaps and lotions. |
| Chlorine dioxide | Chlorine dioxide is a gas under standard conditions that hydrolyses readily in contact with moisture. It has been used for disinfection, sterilisation, bleaching and chemical manufacture. |
| Chlorine trifluoride | Chlorine trifluoride is used as a fluorinating agent, as an igniter and propellant for rockets, in nuclear reactor fuel processing and as a pyrolysis inhibitor for fluorocarbon polymers. |
| Chloroacetaldehyde | Chloroacetaldehyde is primarily used in the synthesis of pharmaceuticals. |
| Chloroacetone | Chloroacetone is used in colour photography and is a common intermediate in chemical manufacturing. |
| alpha-Chloroacetophenone | Commonly called mace, alpha-Chloroacetophenone is used primarily as a riot-control agent and in personal protective devices. |
| Chloroacetyl chloride | Chloroacetyl chloride (CAC) is primarily used as an intermediate in the manufacture of chloroacetophenone and other chemicals. |
| Chlorobromomethane | Chlorobromomethane is primarily used as a fire extinguishing fluid |
| Chlorodifluoromethane | Chlorodifluoromethane is used as an aerosol propellant, a refrigerant, a low-temperature solvent and as a component of fluorocarbon resins. |
| Chloroform | Chloroform is used as a raw material in the chemical industry in the manufacture of fluorocarbons and as an extractant and industrial solvent. |
| bis(Chloromethyl) ether | Bis(Chloromethyl) ether was used extensively in chemical synthesis, in the manufacture of resins and in the textile industry. |
| Chloromethyl methyl ether | Chloromethyl methyl ether is used as a methylating agent. |
| Chloropentafluoroethane | Chloropentafluoroethane was historically used as a refrigerant and as a propellant in aerosol food preparations. |
| Chloropicrin | Chloropicrin is widely used in a range of fumigants, insecticides and fungicides. |
| beta-Chloroprene | Beta-chloroprene is predominantly used for the manufacture of neoprene and polychloroprene latex. |
| 2-Chloropropionic acid | 2-Chloropropionic acid is used as an intermediate in the agricultural, chemical and pharmaceutical industries. |
| o-Chlorostyrene | o-Chlorostyrene is used in organic synthesis and in the preparation of speciality polymers. |
| Chlorosulphonic acid | Chlorosulphonic acid is used as a chemical intermediate for dyes, pesticides resins, pharmaceuticals, surfactants processes and manufacture of synthetic detergents. |
| o-Chlorotoluene | o-Chlorotoluene is used as a solvent and intermediate in the synthesis of other organic chemicals, dyes, pharmaceuticals and synthetic rubber compounds. |
| Clopidol | Clopidol is used as a coccidiostat in poultry. |

**Release 5**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Catechol | Catechol is used as an antioxidant in several industries and in cosmetics, pharmaceuticals, insecticides and inks. |
| Carbon tetrachloride | Carbon tetrachloride was traditionally used as a solvent, a dry-cleaning agent and for fluorocarbon manufacture. Historically used as a fumigant, its use is now banned, with all manufacture, import and export controlled in Australia under the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989. |
| Chlorine | Chlorine is a gas under standard conditions that hydrolyses readily. It is used in various chemical manufacturing applications. Complex mixtures of chlorine and chlorinated by-products arise from its use in disinfectant applications (ACGIH, 2018). |
| 1-Chloro-1-nitropropane | 1-Chloro-1-nitropropane is typically used as an additive in rubber cement production and historically used as a fungicide. |
| Chlorobenzene | 1-Chloro-1-nitropropane is typically used as an additive in rubber cement production and historically used as a fungicide. |
| o-Chlorobenzylidene malononitrile | o-Chlorobenzylidene malononitrile is a ‘tear gas’ and is used primarily by military and law enforcement personnel as an incapacitating agent for crowd control. |
| Chromium (metal),(II),(III)(as Cr) | Chromium (Cr) is only found in nature in a combined state, predominantly Cr(III), and not as a free metal. A wide range of metallic and inorganic chromium compounds can be found in the workplace. |
| Chromium (VI) (as Cr) | Hexavalent chromium (Cr[VI]) compounds have been used in pigments in a range of products and applications. |
| Coal tar pitch volatiles (as benzene solubles) | Coal tar pitch is a dark brown or black residue remaining after redistillation process. The volatiles contain lower molecular weight polycyclic hydrocarbons (PAHs) which sublime into air. The composition of coal tar pitch changes depending on the original raw materials and temperatures used in production. Coal tar is used as a base for coatings and paints, for roofing and paving and as a binder for carbon electrodes used in aluminium smelting. It has often been found as a contaminant in bitumen products. |
| Copper (fume, dusts and mists) | Copper is a widely used structural metal particularly in situations where high electrical and thermal conductivity are required. Copper compounds are also used in pesticides. |
| Cotton dust, raw | Cotton dust is dispersed during the processing of cotton and cotton fibres and is associated with byssinosis and chronic lung effects. |
| Cyanamide | Cyanamide is used as a chemical intermediate for dicyandiamide in melamine production and, as a fumigant, in metal cleaning, refining of ores and the production of synthetic rubber. |
| Cyanides and cyanide salts | Use information not provided |
| Cyanogen chloride | Cyanogen chloride is used in organic synthesis, as a warning agent in fumigant gases and as a poison gas by the military. |
| Cyclohexanone | Cyclohexanone is predominantly used in the production of nylon. It is also used as a solvent in insecticides, paints, paint and varnish removers, natural and vinyl rubbers and in the textile and tanning industries. |
| Cyclohexylamine | Cyclohexylamine is used as a corrosion inhibitor in cooling water feeds and in the chemical manufacture of insecticides, plasticisers, dry-cleaning soaps and dyes. |
| Cyclonite | Cyclonite is predominantly used as an explosive and also as a rodenticide. |
| Decaborane | Decaborane is used as an olefin polymerisation catalyst and in rocket propellant. Toxicological data are limited and no human exposure data are currently available. |
| Demeton | Demeton has historical uses as an insecticide, with use discontinued in several countries |
| Dibutyl phthalate | Dibutyl phthalate (DBP) is used as an insect repellent, solvent and plasticiser and in the manufacture of explosives and propellants, nail polish and lubricating agents. |

**Release 6**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Chlorpyrifos | Chlorpyrifos is a broad-spectrum organophosphate pesticide used widely on plants, animals, some building structures and household pests |
| Cobalt (metal and inorganic) | Cobalt metals and metal powders are used in various applications such as permanent magnets, heat-resistant alloys, high-strength alloys, and tool and die metals. |
| Cobalt compounds (carbonyl and hydrocarbonyl) | Cobalt carbonyl and cobalt hydrocarbonyl are used in industry as a catalyst for a variety of reactions. |
| Cresol (all isomers) | Cresols are found in plant oils, tobacco smoke and formed in fuel combustion processes and are derived from coal tar or petroleum synthesis or oxidation from toluene. Mixtures are used as solvents, disinfectants and particularly wood preservatives with additional use as lubricants and air filter oil additives. |
| Crotonaldehyde | Crotonaldehyde is used in the manufacture of butanol and butylaldehyde. |
| Crufomate | Crufomate is used as an anthelmintic and in the systematic control of grubs, lice and horn flies. |
| Cumene | Cumene is used commercially as a thinner for paints, enamels and in some petroleum products. |
| Cyanogen | Cyanogen is used in organic synthesis, fuel gas for welding, propellant (with ozone or fluorine) and as a fumigant. |
| Cyclohexane | Cyclohexane is used as a solvent, in perfume manufacture, surface coating and removal, in extraction of essential oils, in molecular weight determination and in the manufacturing of various chemicals. |
| Cyclohexanol | Cyclohexanol is manufactured from either cyclohexane or phenol, which may form cyclohexanone as a by-product. It is used in the production of nylon, paints, plastics, degreasers, detergents and insecticides. |
| Cyclohexene | Cyclohexene is used in organic synthesis, as a catalyst solvent, in the manufacture of adipic and maleic acids, in oil extraction and is found in motor vehicle exhaust. |
| Cyclopentadiene | Cyclopentadiene is used in organic syntheses and the chemical manufacture of resins. It is monomeric as a vapour or when freshly distilled and dimerises rapidly to solid dicyclopentadiene upon standing, in which it is commonly handled |
| Cyclopentane | Cyclopentane is used in organic synthesis, as a catalyst solvent, in the manufacture of adipic and maleic acids, in oil extraction and it is found in motor vehicle exhaust. |
| Diazinon | Diazinon is used as an insecticide |
| Diazomethane | Diazomethane is not produced commercially due to its explosive nature, but is produced and used *in situ* as a methylating agent for acidic compounds such as phenols and carboxylic acids. |
| Diborane | Diborane is used as a reducing agent, rubber vulcaniser, polymerization catalyst, flame-speed accelerator, doping agent and in rocket propellant. |
| 1,2-Dibromo ethane | 1,2- dibromo ethane (EDB) is widely used as a fumigant, in waterproofing, as a solvent for resins, in dyes and pharmaceutical manufacturing. |
| Dibutyl phenyl phosphate | Dibutyl phenyl phosphate is used in the production of aviation hydraulic fluids. |
| 2-N-Dibutylaminoethanol | 2-N-dibutyl-aminoethanol (DBAE) is commonly used in industry as an emulsifying, flotation and curing agent as well as a dispersant and absorbant. It is also used as a conditioning agent for textile manufacturing a catalyst in polyurethane foam manufacture and as a anti-corrosion additive. |
| 1,1-Dichloro-1-nitroethane | 1,1-Dichloro-1-nitroethane is used as a fumigant for produce and in organic synthesis. |
| 1,3-Dichloro-5,5-dimethyl hydantoin | 1,3-Dichloro-5,5-dimethyl hydantoin (DCDMH) is used as a chlorinating agent, as an intermediate for amino acids, drugs and insecticides and as a stabiliser for vinyl chloride polymers. |
| Dichloroacetylene | Dichloroacetylene (DCA) is not commercially available in large quantities but can be a generated as a by-product of various processes. |
| o-Dichlorobenzene | *o*-Dichlorobenzene (*o*DCB) is used as a solvent, insecticide, fumigant and as a chemical intermediate, particularly in production of dyes. |
| p-Dichlorobenzene | *p*-Dichlorobenzene (*p*DCB) is used as an insecticide and a fumigant for control of mildew, moulds and moths (moth-balls). |
| 3,3'-Dichlorobenzidine | 3,3’‑Dichlorobenzidine (DCB) is used in the manufacture of azo dyes, as an intermediate for Benzidine Yellow pigments, and possesses similar physical and chemical properties to benzidine. |
| 1,2-Dichloroethylene | 1,2-Dichloroethylene is commonly used as a solvent, chemical intermediate, fermentation retardant, in organic synthesis and as a germicidal fumigant. |
| 2,2-Dichloropropionic acid | 2,2-Dichloropropionic acid is used commercially as an herbicide called Dalapon which is 2,2‑Dichloropropionic acid with either sodium or magnesium salts attached. |
| Dichlorvos | Dichlorvos is an organophosphate pesticide compound |
| Dicyclopentadiene | Dicyclopentadiene is used as an intermediate in chemical manufacture of insecticides, elastomers, metallocenes, paints and plastics. It is produced during the carbonisation of coal, and as a by-product when steam-cracking gas oil and naphtha |

**Release 7**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
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| Cyhexatin | Cyhexatin is organic tin compound used as an acaricide in veterinary products. |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | 2,4-D is widely applied as a herbicide, fungicide and growth regulator (ACGIH, 2018; DFG, 1994). |
| Dichlorodiphenyl-trichloroethane (DDT) | Dichlorodiphenyl-trichloroethane (DDT) is an organochloride pesticide previously used in the agricultural industries and for mosquito control. Its use is heavily restricted across the world, with a ban on use in Australia. |
| Diacetone alcohol | Diacetone alcohol is used as a solvent for nitrocellulose, cellulose acetate, celluloid, pigments, waxes, fats and oils. It has also been used as hydraulic brake fluid and an antifreeze (ACGIH, 2018). |
| Diacetyl | Diacetyl is a naturally occurring chemical found in butter, caramel and coffee. It is an aromatic component in tobacco smoke and occurs in fermented products including beer and wine. Commercially, it is used a food additive where it is used for its buttery flavour. |
| Dibutyl phosphate | Dibutyl phosphate (DBP) is used in the paint industry as a catalyst, in the manufacture of phenolic and urea resins, as a plasticiser, in hydraulic fluids and in the textile industry. |
| 1,4-Dichloro-2-butene | 1,4-Dichloro-2-butene (DCB) is a chemical intermediate for a range of industrial processes. It is identified as a severe irritant, mutagen and animal carcinogen. |
| Dichloroacetic acid | Dichloroacetic acid (DCA) is used as a starting material for glyoxylic acid, dialkyloxy and diaryloxy acids and sulphonamides, and as a substitute for formaldehyde. DCA has also been used as a therapeutic agent for reducing lactate, hyperglycaemia or circulating lipid and lipoprotein levels. |
| Dichlorodifluoromethane | Dichlorodifluoromethane is an ozone-depleting CFC that was previously used as an aerosol propellant, refrigerant and polymeric foam blowing agent. |
| 1,1-Dichloroethane | 1,1-Dichloroethane is used as solvent, fumigant, anaesthetic and as a chemical intermediate. |
| Dichlorofluoromethane | Dichlorofluoromethane is commonly used as a propellant, refrigerant, heat exchange fluid and solvent. |
| Dichloropropene | Dichloropropane (DCP) is traditionally used in agriculture as a fumigant and pesticide through soil injection or drip irrigation. |
| Dicyclopentadienyl iron | Dicyclopentadienyl iron is used as anti-knock agent and combustion catalyst. |
| Diethanolamine | Diethanolamine (DEA) is used in various industrial, commercial and consumer products and processes such as a liquid detergent for emulsion paints, as a corrosion inhibitor and in cosmetic formulations. |
| Diethyl ketone | Diethyl ketone is used as a solvent, in organic synthesis, and in pharmaceuticals. |
| Diethyl phthalate | Diethyl phthalate (DEP) is used in plastic packaging, is present in toiletries and cosmetics, dental impression materials, adhesives, and in food and pharmaceutical packaging. |
| Diethyl sulfate | Diethyl sulfate is primarily used as an ethylating agent in the manufacture of dyes, pigments and textile chemicals, and as a finishing agent in textile production. |
| Diethylamine | Diethylamine is commonly used in pharmaceutical products, in resin manufacturing and in pesticides, dyes, in electroplating processes and as a corrosion inhibitor. |
| Diethylene triamine | Diethylene triamine is used as a solvent, fuel component and saponification agent for acid materials. |
| Difluorodibromomethane | Difluorodibromomethane is used as a as a fire extinguishing agent and in dyes, pharmaceuticals and quaternary ammonium compounds (ACGIH 2018). |
| Diglycidyl ether (DGE) | Diglycidyl ether (DGE) is commonly used as a textile-treating agent, and as a chlorinated organic compound stabiliser. |
| Diglycidyl resorcinol ether | Diglycidyl resorcinol ether is used in a variety of commercial products such as adhesives, surface treatments, paints and varnishes, and in construction materials (NICNAS, 2015). |
| Diisobutyl ketone | Diisobutyl ketone is used as a diluent for epoxy resins, as a textile-treating agent and as a chlorinated organic compound stabiliser. |
| Diisopropylamine | Diisopropylamine is used in the production of paint pigments, pharmaceuticals, cosmetics and pesticides. |
| Dimethyl acetamide | Dimethyl acetamide (DMAC) is widely used as a solvent for many organic reactions and in pharmaceutical preparations for parenteral administration (ACGIH, 2018). |
| Dimethyl carbomoyl chloride | Dimethyl carbamoyl chloride is used as a chemical intermediate in the manufacture of carbamate pesticides, dyes and drugs. |
| Dimethyl ether | Dimethyl carbamoyl chloride is used as a chemical intermediate in the manufacture of carbamate pesticides, dyes and drugs. |
| Dimethyl sulfide | Dimethyl sulfide is an industrial contaminant released from pulp and paper, oil refineries and sewerage treatment plants. Dimethyl sulfide is also produced by bacteria in periodontal pockets and is an intermediary from methionine metabolism. It is found in fragrance formulations and in several food substances, including butter, oil and bread (ACGIH, 2018). |
| Dimethylaminoethanol | Dimethylaminoethanol is used as a component of adhesives and binding agents, and in colouring agents in commercial and domestic products. |
| Dimethylformamide | Dimethylformamide (DMF) is widely used as a solvent in the production and processing of polymers and pharmaceuticals, as a co-solvent in the manufacture of protective coatings, adhesive, printing inks, fibres and synthetic leather, and as a catalyst and carrier for gases in various industrial processes (ACGIH, 2018; HCOTN, 2011; US EPA, 1990). |
| Dimethylsulfamoyl chloride | Dimethylsulfamoyl chloride is used in pharmaceutical drug manufacture. |
| Dinitolmide | Dinitolmide is used as a substance administered to poultry to retard the growth and reproduction of coccidian parasites and as a feed additive. |
| Dinitrobenzene (m-, o-, p- isomers) | Ortho-, meta- and para-dinitrobenzene (DNB) are usually manufactured together and used in the manufacture of dyes, in explosives, as a camphor substitute in the production of celluloids and in organic syntheses. |
| Dinitro-o-cresol | Dinitro-o-cresol (DNOC) is used as a herbicide and insecticide and is a cumulative poison in humans that is absorbed through the skin. |
| Dinitrotoluene | Dinitrotoluene (DNT) is used in the production of toluene diisocyanate and toluene diamine, which are intermediates in the making of polyurethane foams and polymers. |
| 1,4-Dioxane | 1,4-Dioxane is used in paints, as a solvent in organic products, as a stabiliser in chlorinated solvents, varnish and paint strippers, dyes and lacquers, in certain fumigants, deodorants and preservatives. It is produced by commercial dehydrogenation of ethylene glycol. |
| Dioxathion | Dioxathion is an organophosphate pesticide and is considered highly toxic. No longer in use, it was previously used to control a variety of pests on crops and livestock. |
| 1,3-Dioxolane | 1,3-Dioxolane is used as in polymer and halothane production, and as a solvent. |
| Diphenylamine | Diphenylamine is used as an industrial and agricultural antioxidant, fungicide and antiparasitic. |
| Dipropyl ketone | Dipropyl ketone is used as a solvent and in food flavourings. |
| Diquat | Diquat is primarily used as a herbicide. |
| Disulfiram | Disulfiram is a drug (Antabuse™) used in the treatment of chronic alcoholism by producing an acute sensitivity to ethanol. |
| Divinyl benzene | Divinyl benzene is used as a starting material in the manufacture of various polymers. |
| Ethylenediaminetetraacetic acid (EDTA) | EDTA is used as a sequestering agent for aqueous metal ions and added to detergents, textile processing and water treatment formulations, and cosmetics. |
| Emery (dust) | No use/source data provided in evaluation report. |
| Endrin | Endrin was formerly used as an organochlorine insecticide and rodenticide. Its use was discontinued since the late 1980s (ACGIH, 2018) and it is prohibited for use in Australia. |
| 2-Ethoxyethanol | 2-Ethoxyethanol is used as a solvent for nitrocellulose, natural and synthetic resins and as a mutual solvent for the formulation of soluble oils. |
| Ethylene oxide | No use/source data provided in evaluation report |
| 2-Ethylhexanol | 2-Ethylhexanol (EH) is used in the production of plasticisers and lubricants |

**Release 8**

| **Substance** | | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- | --- |
| Dichloroethyl ether | Dichloroethyl ether is used as a chemical intermediate, wetting agent, penetrant, fumigant, solvent, dewaxing agent and in lacquers, resins and oils. | |
| Dichlorotetrafluoroethane | Dichlorotetrafluoroethane (CFC-114) was previously used as an aerosol propellant, refrigerant, solvent, fire extinguisher, blowing agent and dielectric fluid. It is an ozone-depleting chlorofluorocarbon. | |
| 2-Diethylaminoethanol | 2-Diethylaminoethanol (DEAE) is used as a curing agent for resins, as an emulsifying agent (soaps, cosmetics, cutting oils) and as a fabric softener. | |
| Dimethylamine | Dimethylamine is used as an accelerator in vulcanising rubber, tanning, manufacture of soaps, solvents, pharmaceutical preparations and in textile chemicals. Certain fish, meat, dairy and grains contain dimethylamine. | |
| N,N-Dimethylethylamine | N,N-dimethylethylamine is used in the manufacture of other chemicals. | |
| 1,1-Dimethylhydrazine | 1,1-Dimethylhydrazine (UDMH) is used as a component of jet and rocket fuels, an absorbent for acid gases, in photography and in chemical synthesis. | |
| Disulfoton | Disulfoton is an organophosphate insecticide used on cotton, tobacco, sugar beet, corn, peanuts, wheat, potatoes and cereal grains. | |
| Enflurane | Enflurane is commonly used as an anaesthetic. | |
| Ethion | Ethion is an organophosphate insecticide used on citrus fruits, deciduous fruits, nuts and cotton. | |
| Ethyl alcohol | Ethyl alcohol encountered in the workplace is used as a solvent, additive to disinfectants or as a starting material in various chemical manufacture and pharmaceutical settings. | |
| Ethyl butyl ketone | Ethyl butyl ketone (EBK) occurs naturally in breads and other baked goods and is used as a fragrance in soaps, perfumes, detergents and creams and lotions. | |
| Ethyl cyanoacrylate | Ethyl 2-cyanoacrylate (ECA) and methyl 2-cyanoacrylate (MCA) are used as adhesives in the high-bond-strength, fast-acting household superglues. Approximately 90% of the commercial volume is ECA, with continuing decrease in MCA volume | |
| Ethyl mercaptan | Ethyl mercaptan is used in the production of plastics, insecticides, antioxidants and as an odourant in natural gas supplies. | |
| Ethyl silicate | Ethyl silicate is used in coating applications as a weatherproofing and acid-proofing agent for cement, and in heat-resistant paint production. | |
| Ethylene | Ethylene is a gas under standard conditions and is used as a starting material in the manufacture of plastics and small organic compounds, as a plant maturation hormone in the food industry and occasionally as an anaesthetic. | |
| Ethylene chlorohydrin | Ethylene chlorohydrin is used as a solvent and in the manufacture of ethylene glycol and ethylene oxide. | |
| Ethylene thiourea | Ethylene thiourea (ETU) is used as an intermediate for antioxidants and in the manufacture of synthetic resins. | |
| 2-Ethylhexanoic acid | 2-Ethylhexanoic acid (2-EHA) is used as an industrial intermediate for the preparation of metallic salts of lead, cobalt, manganese, zinc, calcium, iron and zirconium. | |

**Release 9**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Dicrotophos | Dicrotophos has been used as a systemic and contact organophosphorus insecticide effective in targeting sucking, boring and chewing pests |
| Dieldrin | Dieldrin is an organochloride insecticide reported to have been used for control of pests in the corn and citrus industry |
| Diethylene glycol monobutyl ether\* | Diethylene glycol monobutyl ether (DGBE) is used as a solvent for nitrocellulose, oils, dyes, gums, soaps and polymers. It is also used as a coalescing agent in latex paints and in hard surface cleaners. |
| Dimethyl Sulphate | Dimethyl sulphate is used as a methylating agent in the manufacture of many organic chemicals including dyes, perfumes, pharmaceuticals, separation of mineral oils and analysis of automobile fluids |
| N,N-Dimethylaniline | N,N-Dimethylaniline is widely used in manufacturing as a solvent, an intermediate and reagent for dyes, a rubber vulcanising agent and as a catalyst |
| Dimethyl phthalate | Dimethylphthalate (DMP) is used in industrial and in consumer products, for example as a fragrance ingredient in cosmetics, domestic and personal care products, as a solvent and plasticiser for cellulose acetate compositions, and in insect repellents, lacquers, paints, plastics and rubbers. |
| Di-sec-octyl phthalate | Di-sec-octyl phthalate (DEHP) is used as a plasticiser for polyvinyl chloride (PVC) resins and vinyl chloride copolymer resins. |
| Diuron | Diuron is a herbicide and soil steriliser that inhibits photosynthesis. |
| Endosulfan | Endosulfan has been widely applied as an insecticide |
| Epichlorohydrin | Epichlorohydrin is used as a raw material for the manufacture of epoxy resins. It is used in various industrial applications (insecticides, adhesives, resins, solvents and glycidyl esters), glycerol production and in the manufacturing process for pharmaceuticals. |
| EPN | EPN is an organophosphate pesticide used as a non-systemic insecticide and acaricide. |
| Ethanolamine | Ethanolamine is used in the manufacture of antibiotics, hair waving solutions, as a chemical dispersal agent, in the synthesis of surface-active agents and in emulsifiers and polishes. Limited data are available in humans |
| 2-Ethoxyethyl acetate | 2-Ethoxyethyl acetate is used as a blush retardant in lacquers, as a solvent for nitrocellulose, oils and resins, in wood stains and varnish removers and in products for the treatment of textiles and leathers. |
| Ethyl acrylate | Ethyl acrylate is used to make acrylic resins and as emulsion and solution polymers for surface coating textiles, paper and leather. It is also used in the production of acrylic fibres, adhesives and binders. |
| Ethyl benzene | Ethyl benzene is primarily used as a solvent, as an intermediate in the production of styrene and in the plastics and rubber industries. |
| Ethyl ether | Ethyl ether is used as a solvent and formerly as an anaesthetic. |
| Ethyl formate | Ethyl formate is used as a solvent, fungicide, larvicide, and flavouring agent. |
| Ethylamine | Ethylamine is used as a solvent, in chemical manufacture and petroleum refinement. |
| Ethylene glycol dinitrate | Ethylene glycol dinitrate is used in explosives and may be present in dynamite formulations up 80%. |
| Ethylenediamine | Ethylenediamine (EDA) is used as an intermediate in the manufacture of chelating agents, fungicides, synthetic waxes, polyamide resins, and corrosion inhibitors. |
| Ethylidene norborene | Ethylidene norbornene (ENB) is used in the formation of polymer precursors during polymer production |
| N-ethylmorpholine | N-Ethylmorpholine is used as a catalyst in the manufacture of urethane foam and as an intermediate for dyestuffs, pharmaceuticals, rubber accelerators and emulsifying agents and as a solvent for dyes, resins and oils. |
| Fenamiphos | Fenamiphos is an organophosphate insecticide that is no longer registered for use in Australia. |
| Fensulfothion | Fensulfothion is an organophosphate insecticide that was registered for use in the USA until 1990. |
| Ferrovanadium dust | Ferrovanadium dust has been used in the preparation of steel containing vanadium. |
| Formaldehyde | Use information not provided in Draft Evaluation Report. |

**Release 10**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Diesel engine emissions | Emissions from diesel engines consist of a mixture of hundreds of chemical compounds, which are emitted in the gaseous and the particulate phase. The composition of emissions varies depending on several factors including engine type, fuel type and operating conditions. |
| Ethyl acetate | Ethyl acetate is used as a solvent for varnishes, lacquers and nitrocellulose and artificial essences. |
| Ethyl chloride | Ethyl chloride has been used in the manufacture of tetraethyl lead, ethylcellulose, dyes, drugs and perfumes. It has also been used in industry for chemical processes. |
| Ethylene dichloride | Ethylene dichloride has been used as a degreaser, fumigant, solvent and as an intermediate in the production of vinyl chloride |
| Ferbam | Ferbam is used as a fungicide. |
| Flour Dust (cereal) | Flour is used to make foods for human or animalconsumption**.** |
| Formamide | Formamide is commonly used as an intermediate in the manufacture of esters, hydrocyanic acid, pharmaceuticals and pesticides, as a softener for glues, paper and water-soluble gums and a solvent for the production of plastics |
| Furfural | Furfural is commonly used as a solvent and as an intermediate in the production of various domestic and commercial products |
| Furfuryl alcohol | Furfuryl alcohol is commonly used as an industrial solvent and intermediate for the production of resins |
| Gallium arsenide | Gallium arsenide is used as a semiconductor in transistors, solar cells and lasers. |
| Germanium tetrahydride | Germanium tetrahydride is used in the production of solid-state electronic circuits. |
| Glycidol | Glycidol is primarily used as a stabiliser in the manufacture of vinyl polymers. |
| Hafnium | Hafnium is used in control rods in nuclear reactors and the manufacture of light bulb filaments, electrodes and special glasses. |
| Halothane | Halothane has been used as a clinical anaesthetic for over 40 years. |
| Hard metals (containing cobalt and tungsten carbide) | Hard metals are used in saw tips, cutting tools, wear-resistant materials and a wide variety of emerging applications. Hard metals are blends compressed and sintered from powder components and consisting mainly of tungsten carbide (WC) and other metals, in most cases cobalt (Co). |
| Heptachlor | Heptachlor is as an insecticide. |
| Heptane (n-Heptane) | Heptane and isomers are used in organic synthesis and are ingredients of petrol and rubber solvent naphtha and other petroleum products that used as solvents and fuels. |
| Hexachlorobutadiene | Hexachlorobutadiene (HCBD) is a by-product of processes associated with the chlorination of hydrocarbons and has been used as a solvent for elastomers, heat transfer liquid, transformer and hydraulic fluid. HCBD has also been used as a pesticide with limited applications. |
| Hexachloro- cyclopentadiene | Hexachlorocyclopentadiene is used as an intermediate in the manufacture of chlorinated pesticides. |
| Hexachloroethane | Hexachloroethane (HCE) is commonly used as an anthelmintic, an insecticide, in pyrotechnics and chemical manufacture and as a chlorination by-product. |
| Hexachloronaphthalene | Hexachloronaphthalene is commonly used in electric wire insulation and lubricants. |
| Hexafluoroacetone | Hexafluoroacetone is used as a chemical intermediate, solvent and polymer adhesive. |
| Hexahydrophthalic anhydride | Hexahydrophthalic anhydride (HHPA) is primarily used as a hardener in epoxy resin systems. |
| Hexane, other isomers | Hexanes are solvents used in vegetable oils, glues, coatings and paints. They are also found in petroleum fuels. |
| sec-Hexyl acetate | *sec*-Hexyl acetate is used as a solvent and fragrance ingredient. |
| Hexylene glycol | Hexylene glycol is used in oil and water-based paints, lacquers and varnishes and as a solvent plasticiser. |
| Hydrogen bromide | Hydrogen bromide gas is used in certain processes to dissolve ores, in the manufacture of bromides and can form during accidental pyrolysis of bromo-fluorohydrocabons. |
| Hydrogen chloride | Use information not provided. |
| Hydrogen cyanide | Use information not provided. |
| Hydrogen fluoride (as F) | Hydrogen fluoride (HF) is used in many industrial processes, such as production of aluminium, inorganic fluorides, oil alkylation and etching of glass and ceramics. |
| Hydrogen peroxide | Hydrogen peroxide is widely used for bleaching or deodorizing of textiles, wood pulp, hair and fur and in the treatment of water and sewage. |
| Hydrogen selenide (as Se) | Hydrogen selenide is used in the preparation of semiconductor materials and in chemical synthesis by metal selenides, lasers and emulsions. It is readily produced by the action of acids on inorganic selenides. |
| Hydrogen sulfide | Hydrogen sulfide is a colourless gas with a characteristic odour of “rotten eggs” occurring in the gases from stagnant bodies of water, crude petroleum and natural gas. Occupational exposure occurs principally from its presence in crude petroleum, natural gas, soil, and sewerage and as a by-product of chemical reactions in various industries. |
| Hydrogenated terphenyls | Hydrogenated terphenyls comprise a complex mixture of ortho-, meta- and para-terphenyls in various stages of hydrogenation. It is used in heat-transfer agents, dye solvents in carbonless paper and in plasticizer applications. |
| Hydroquinone | Hydroquinone is used in various commercial situations including as a stabiliser in paints, varnishes, motor fuels and oils; and as a chemical intermediate in dyes. |
| Hydroxyacetic acid butyl ester | Hydroxyacetic acid butyl ester is used as general adhesive and binding agent for a variety of uses |
| Hydroxypropyl acrylate | Hydroxypropyl acrylate and its isomers are used in the manufacture of thermosetting resin for surface coatings. |
| Iodine | Iodine and iodide salts are essential nutrients and used as feedstock supplements, catalysts, inks, and disinfectants. |
| Iodoform | Iodoform is used as an antiseptic and disinfectant. |
| Iron oxide fume and dust (Fe2O3) (Fe) | Iron oxide is used as a polish, a pigment, a component of cement and as a catalyst. It is also used in electronics and may be present in welding fumes. |
| Iron pentacarbonyl (as Fe) | Iron pentacarbonyl is used as an anti-knock agent in petrol and may form due to the reaction of finely divided iron with carbon monoxide. |
| Isobutyl alcohol | Isobutyl alcohol is used as a solvent and flavouring agent. |
| Isooctyl alcohol | Isooctyl alcohol is a mixture of closely related isomeric, primary alcohols. It is used as a solvent, chemical intermediate, hydraulic fluid, emulsifier, antifoaming agent and in drying, cutting and lubricating oils. |
| Isophorone | Isophorone is used as a solvent and intermediate in pesticide production. |
| Isopropoxyethanol | Isopropoxyethanol is used as a solvent for latex paints, resin coatings, and textile dyes. |
| Isopropyl alcohol | Isopropyl alcohol is used as a solvent, a disinfectant, as an ingredient in consumer cosmetics and as raw material in chemical manufacture. |
| Isopropyl ether | Isopropyl ether is primarily used as a solvent. |
| Ketene | Ketene is a gas under standard conditions that polymerises readily. It is used as an intermediate in chemical manufacture. |
| Lead arsenate (as Pb3[AsO4]2) | Use information not provided., |
| Lead chromate (as Cr) | Lead chromate and related compounds have historically been used as pigments in oils and paints. It is considered a hexavalent chromium (Cr[VI]) compound. |
| Lindane | Lindane is a stereoisomer of hexachlorocyclohexane (HCH) and was formerly used as an insecticide and an ingredient in wood preservatives. |
| Lithium hydride | Lithium hydride is a chemical synthesis precursor in hydrogen generators. It is used in the manufacture of ceramics and special glass; both as a coolant and in shielding in nuclear reactors, and as a desiccant to dry materials in industrial processes. |
| Magnesite | Magnesite is used to make various grades of magnesium oxide (MgO), to produce carbon dioxide (CO2) and refractories. It is also used as a bulking compound in powder formulations, the production of antacid, as an additive to make table salt, in cosmetics and in fire-resistant and insulating materials. |
| Magnesium oxide (fume) | Magnesium oxide (MgO) powder is used in heat-resistant ceramics, firebricks, pharmaceuticals, food additives and enteric acid-neutralising agents. In solution, it is hydrated to magnesium hydroxide and used as an antacid and cathartic. |
| Malathion | Malathion is used as a broad-spectrum pesticide. Use in Australia is heavily restricted. |
| Manganese cyclopenta-dienyl tricarbonyl (as Mn) | Manganese cyclopenta-dienyl tricarbonyl (MCT) is commonly used as an antiknock agent, increasing the octane rating in unleaded petrol. |

**Release 11**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Ethyl bromide | Ethyl bromide is used as an ethylating agent and solvent in the chemical and pharmaceutical industries and has been used as a refrigerant. | |
| Fenthion | Fenthion is an organophosphate insecticide used for mosquito control in residential areas by aerial and ground application and for livestock dermal treatments. | |
| Fluorides (as F) | Fluorides comprise simple to complex compounds of fluorine (F) with other chemical elements and are used in a wide range of commercial and domestic uses including as an additive to drinking water (sodium fluoride) to reduce dental caries. | |
| Fluorine | Fluorine is encountered during its production and use as a rocket propellant, in the manufacture of various fluorides and fluorocarbons and in various organic and inorganic syntheses. | |
| Fonofos | Fonofos is an organothiophosphate insecticide that was primarily used on corn, generally applied by ground equipment or aerial application. | |
| Glutaraldehyde | Glutaraldehyde is widely used as cold steriliser aqueous solution in medical clinics and hospitals for cleaning delicate items or electronic materials. Other applications in industrial workplaces include as a tanning agent, a biocide in metalworking fluids, oil and gas pipelines, water treatment systems and preservative in fabric softeners. | |
| Glycerin mist | Glycerin is widely used in the food, pharmaceutical and lubricant industries and is also a major component e-cigarette liquid. | |
| Hexamethyl phosphoramide | Hexamethyl phosphoramide (HMPA) is used as a solvent for polymers, a selective solvent for gases and a thermal and ultraviolet radiation degradation stabiliser in various polymers. | |
| Hexane (n-Hexane) | Commercial grades of *n*-hexane are used as solvents for vegetable oils, coatings, paints, or adhesives and are employed as denaturants for ethanol. Analytical grade *n*-hexane is a commonly used solvent in laboratories. | |
| Hydrazine | Hydrazine occurs naturally as a product of microbial nitrogen fixation and has been detected in cigarette smoke. It is used as a chemical intermediate, reducing agent, rocket fuel and boiler-water treatment agent. | |
| Indene | Indene is used in the preparation of resins, paint, in tile manufacture and as a chemical synthesis intermediate. Indene is also found in petrochemical process streams and in mixed hydrocarbon exposures. | |
| Indium & compounds (as In) | Indium and its compounds are used in a variety of alloys and electronic applications including semiconductors and bearings in heavy machinery. | |
| Isoamyl alcohol | Isoamyl alcohol is used as a solvent in the manufacture of photographic and pharmaceutical chemicals. | |
| Isopropyl glycidyl ether (IGE) | Isopropyl glycidyl ether is used as an organic compound stabiliser, reactive diluent and chemical intermediate. | |
| Isopropylamine | Isopropylamine is primarily used as a solvent, depilatory, solubiliser and a chemical intermediate. | |
| N-Isopropylaniline | N-isopropylaniline is used as a dye and in chemical synthesis. | |
| Kaolin | Kaolin is a clay that consists primarily of kaolinite, a non-fibrous silicate of aluminium. It is commonly used as a filler and coating in paper, paint, plastics and ceramics. | |
| LPG (liquefied petroleum gas) | Liquefied petroleum gas (LPG) is a by-product of petroleum refinement and is used as a fuel. It consists primarily of propane and butane mixtures with smaller components of C1–C7 hydrocarbons. | |
| Maleic anhydride | Maleic anhydride (MA) is produced through oxidation of n-butane or vapour phase oxidation of benzene and used in the production of polyester resins used in coatings, epoxies, ink, pesticides, lubricant additives and pharmaceuticals. | |
| Manganese, fume, dust & compounds (as Mn) | Manganese (Mn) is an essential human trace element and important co-factor in many enzymes processes. Raw material is used extensively for alloy production in combination with other metals in steel production. It is also used in production of dry-cell batteries, fireworks, glass production or as a fungicide. Inorganic compounds of manganese are used as process catalyst and found in animal feed. Manganese fume generation is associated with welding manganese containing alloys. | |
| 4-Methoxyphenol | 4-Methoxyphenol is primarily used as a chemical inhibitor, stabiliser and intermediate. | |
| Methyl acetate | Methyl acetate is used as a solvent, flavouring, biodegradation catalyst and in the manufacture of perfume, dyes, lacquers, plastics and artificial leather. | |
| Methyl acetylene | Methyl acetylene is used as a welding torch fuel, a chemical intermediate and propellant. | |
| Methyl acetylene-propadiene mixture (MAPP) | Methyl acetylene-propadiene mixtures (MAPP) are used as industrial cutting fuel. | |
| Methyl acrylate | Methyl acrylate is used as a co-monomer with acrylonitrile in the production of acrylic and modacrylic fibre, in paint rollers, battery separators and protective clothing. | |
| Methyl bromide | Methyl bromide is used as a fumigant, and historically as a refrigerant and fire extinguisher; however, this use is discontinued. | |
| Methyl chloride | Methyl chloride is used as a methylating agent in the production of a range of chemical products including silicones, plastics, pesticides and pharmaceuticals. | |
| Methyl formate | Methyl formate is used primarily as an insecticide (fumigant, larvicide), solvent, blowing agent and in organic synthesis. | |
| Methyl hydrazine | Methyl hydrazine is used primarily as a component of jet fuels and altitude control fuel in missile propellants and transfilling gas or liquids. It is also used as a chemical intermediate, solvent and in pharmaceuticals. | |
| Methyl iodide | Methyl iodide is used primarily in microscopy and as a methylating agent in chemical synthesis. | |
| Methyl isobutyl carbinol | Methyl isobutyl carbinol is used as a solvent for gums, resins, dyestuffs. and oils. It also is used in flotation processes and brake fluids. | |
| Methyl isobutyl ketone | Methyl isobutyl ketone (MIBK) is used as a component of cellulose and polyurethane lacquers and paint solvents, as an extraction solvent and in the manufacture of methyl amyl alcohol. | |
| Methyl isocyanate | Methyl isocyanate is used as a chemical intermediate in the production of a wide variety of insecticides and herbicides and in the production of polyurethane foams and plastics. | |
| Methyl isopropyl ketone | Methyl isopropyl ketone (MIPK) is a by-product of hot gas welding on PVC. | |
| Methyl mercaptan | Methyl mercaptan is used as an intermediate in pesticides, fungicides and jet fuel production and in the synthesis of methionine and plastics. | |
| Methyl methacrylate | Methyl methacrylate is used as monomer in the production of acrylic polymer for sheeting, dental reconstruction, medical implants and concrete impregnation. | |
| Methyl parathion | Methyl parathion is used as a broad-spectrum insecticide. | |
| Methyl propyl ketone | Methyl propyl ketone (MPK) is used as a solvent, reagent and flavouring agent. | |
| Methylacrylonitrile | Methylacrylonitrile is used in the production of plastic elastomers and coatings, including microcapsules, and as an intermediate in preparation of bulk chemicals. | |
| Methylcyclopentadienyl manganese tricarbonyl (as Mn) | 2-methylcyclopentadienyl manganese tricarbonyl (MMT) is used in fuels as a smoke abatement additive and combustion improver. | |
| Methylene chloride | Methylene chloride is predominantly used as a solvent, including in paint stripper and degreasers, flavour extraction and as a blowing agent for polyurethane foams. | |

**Release 12**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| 2,6-Di-tert-butyl-p-cresol | 2,6-Di-tert-butyl-*p*-cresol (BHT) is used in ground vehicle and aviation fuels, lubricants, turbines and insulating oils. BHT is also used as a food antioxidant and in food packaging materials. |
| Ethylenimine | Ethylenimine is used as an intermediate and monomer for oil additive compounds, ion exchange resins, coating resins, pharmaceuticals, adhesives, polymer stabilisers and surfactants. |
| Formic acid | Formic acid is used in the dyeing and finishing of textiles and paper, the treatment of leather, electroplating, brewing, silvering glass and as an intermediate in the production of chemicals. |
| Glyoxal | Glyoxal is used in textiles (permanent press finishes), glues, biocides, embalming fluids, leather tanning and paper coatings. It occurs naturally in brewed coffee and some edible oils. |
| Grain dust (oats, wheat, barley) | The recommended TWA is for exposure to the total dust produced during harvesting and handling activities of whole grain of oat, wheat and barley prior to the milling operation. |
| Graphite (All forms except fibres) (Respirable dust) (Natural and synthetic) | Graphite is used in the manufacture of crucibles for melting nonferrous metals, for foundry facings, for re-carburising steel, in various lubricants, as electrodes, as filters in dry cells, as an art medium and in carbon brushes for electrical motors and other electrical equipment. |
| Hexachlorobenzene | Hexachlorobenzene (HCB) is mainly used as a fungicide on grains. It is also used in additive polymers (such as polyvinyl chloride), for pyrotechnic compositions for military purposes and as a porosity controller in the manufacture of electrodes. |
| Iron salts, soluble (as Fe) | Iron salts are used in sewage treatment, textile pigmentation, metallurgy, pharmaceuticals and as livestock feed additives. |
| Alkyl mercury compounds | Alkyl mercury compounds are used as fungicides in seed dressings and foliage sprays. It is also used as preservative solutions for wood, paper pulp, textiles and leather. Common alkyl mercurial includes methylmercury (MeHg), ethylmercury and phenylmercury and their salts. |
| Mercury and compounds | Mercury (Hg) is extensively used in thermometers, barometers, gauges and valves and is heavily used in dry cell batteries, lamps, wiring and switching devices and electronic equipment. Mercury is produced as by-product of gold and bauxite mining. |
| Mesityl oxide | Mesityl oxide is used as a solvent, flotation agent in ore purification and insect repellent. |
| Methomyl | Methomyl is used as a broad-spectrum pesticide for field and fruit crops. |
| 1-Methoxy-2-propanol acetate | 1-Methoxy-2-propanol acetate is used primarily in inks, coatings, cleaners and as a solvent. |
| Methyl alcohol | Methyl alcohol is used as a solvent for various natural and synthetic resins, as antifreeze, and as denaturant for ethanol. |
| 2-Methylbutyl acetate | 2-Methylbutyl acetate is used as a solvent, flavouring agent and in insecticides. Commercial supplies often consist of mixtures of various pentyl acetate isomers. |
| Methyl demeton | Methyl demeton is used as a systemic and contact organophosphate insecticide |
| 4,4’-methylene bis(2-chloroaniline) | 4,4’-methylene bis(2-chloroaniline) (MOCA) is used a curing agent in polyurethane production. |
| 4,4-Methylenedianiline | 4,4-Methylenedianiline (MDA) has primarily been used in closed system preparation of isocyanates and polyisocyanates. |
| Methyl ethyl ketone peroxide | Methyl ethyl ketone peroxide (MEKP) is used to initiate polymerisation of plastic monomers and as a catalyst in cross-linking unsaturated polyester resins |
| Methyl isoamyl ketone | Methyl isoamyl ketone (MIAK) is used as a solvent for cellulose esters, acrylics and vinyl copolymers. |
| Methylal | Methylal is used as a special purpose fuel, in perfumes, as a solvent for adhesives and coatings and as an anaesthetic in human surgery. |
| Methyl n-amyl ketone | Methyl n-amyl ketone is used as a solvent in perfumes. It is also used as a flavouring agent and food additive. It also occurs naturally in clove and cinnamon bark oil. |
| Methyl tert-butyl ether | Methyl tert-butyl ether is used almost exclusively as an octane enhancer in fuel and as a petrol additive in unleaded fuel to reduce unburnt hydrocarbon emission. |
| Methyl vinyl ketone | Methyl vinyl ketone is used as a precursor to produce styrene-methyl vinyl ketone polymers, as an alkylating agent, a component of resins, and an intermediate in the synthesis of steroids and vitamins |
| Metribuzin | Metribuzin is used as a herbicide to control grasses and broad-leaf weeds infesting food and grain crops. |
| Mevinphos | Mevinphos is an organophosphate that was widely used as an insecticide for flowers and crops. It is a restricted chemical that is still used for specific applications in Australia. |
| Mica | Mica is used in a variety of products including pharmaceuticals, paint, wallpaper and as an insulator in electrical equipment. |
| Molybdenum (insoluble compounds) | Metallic molybdenum is used in high temperature and tool steel alloys, in aircraft parts and metal ceramic composite. Molybdenum is an essential element necessary for human health. This evaluation refers to metallic and insoluble molybdenum compounds. There is a separate evaluation for soluble molybdenum compounds. |
| Molybdenum (soluble compounds) | Soluble molybdates are used in corrosion control in ceramic glazes, enamels and pigments and as a reagent for chemical analysis. Molybdenum salts can be found in fertilisers for leguminous crops. Molybdenum is an essential element necessary for human health. This evaluation refers to soluble molybdenum compounds with most of the data being for molybdenum trioxide (MoO3). There is a separate evaluation for metallic and insoluble molybdenum compounds. |
| Morpholine | Morpholine is mostly used in cleaning agents and additives, dishwashing and laundry detergents, corrosion inhibitors and photo chemicals. |
| Naphthalene | Naphthalene is primarily used in the production of phthalic anhydride. It is also used in carbamate pesticide, naphthalene sulfonates, dyes, synthetic resins, antiseptics, pigments and smokeless powder. In crystalline form, it is commonly used as a deodorant, moth repellent and pesticide. |
| Natural rubber latex | Natural rubber latex is a starting material for the rubber industry. |
| Nitrous oxide | Nitrous oxide is used as an anaesthetic in medical, dental and veterinary practices. It is also used as a propellant, foaming agent and an oxidant in rocket fuels. |
| N-methylaniline | N-methylaniline is used as an acid acceptor, a solvent, and in organic syntheses. |

**Release 13**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| 5-Methylheptan-3-one | 5-Methylheptan-3-one is used as a solvent for nitrocellulose-alkyd, nitrocellulose-maleic and vinyl resins. |
| Methyl n-butyl ketone | Methyl n-butyl ketone (MnBK) is used in paints, lacquers, ink thinners, glues, resins, oils and waxes. |
| Monochloroacetic acid | Monochloroacetic acid is used as a post-emergence herbicide and detergent, disinfectant and drying agent for canning processes. It is also used as an intermediate for several chemicals including synthetic caffeine and dyes |
| o-Methylcyclohexanone | Methylcyclohexanone has been used as a solvent in the production of lacquers, varnishes and plastics. It has also been used in the leather industry and as a rust remover. |
| Naled | Naled is an organophosphate insecticide used to control mosquitos and other insects in field crops and plants. |
| Nitrobenzene | Nitrobenzene is used as an intermediate in the preparation of aniline, benzidine and other chemicals. It is also used in the manufacture of cellulose ethers and acetate, in shoe and metal polishes and as a solvent. |
| *p*-Nitrochlorobenzene | *p*-Nitrochlorobenzene (PNCB) has been used as an intermediate in the manufacture of dyes, rubber and agricultural chemicals. |
| Nitrogen dioxide | Nitrogen dioxide (NO2) is found in ambient air as a product of natural as well as human activities. Occupational exposure to NO2 can occur from exhaust from combustion engines, during gas welding, in agriculture, mining explosives, fertiliser production and power plants. |
| 5-Nitro-o-toluidine | 5-Nitro-o-toluidine is the main component in over 35 technical dyestuff bases. It is used in wood stains and polishes and colour in detergents and paper |
| Nitrotoluene, 3- and 4- isomers | 3-nitrotoluene is used in the manufacture of agricultural and rubber chemicals. It is also used in various dyes for cotton, wool, silk, leather and paper and in azo and sulfur dye. 4-Nitrotoluene is produced in negligible quantities. |
| Nonane | Nonane is used as a fuel additive, solvent and detergent. As a component in fuel, it is present as a mixture with other nonane isomers. |
| Octachloronaphthalene | Octachloronaphthalene has been used as a fireproof and waterproof additive in cable insulation and in other protective coating materials. |
| Octane | Octane is used as a solvent and additive in distillations. It is also present in petrol as an isomeric mixture. |
| Oil mist, refined mineral | Mineral oils are primarily used in the lubrication of motor vehicles. Mineral oils are also used in a variety of applications such as the cutting, grinding, drawing, rolling and press-forming of metals; as coolants; and as solvents in the printing industry. |
| Osmium tetroxide | Osmium tetroxide is used as a biological stain for adipose tissues in histopathological laboratories, used in photography and as a catalyst in organic synthesis. |
| Oxalic acid | Oxalic acid is used for disinfection, rust removal and in dye and rubber manufacture. |
| Paraquat (respirable) | Paraquat is a quick-acting, non-selective herbicide used for broad spectrum control of broadleaf weeds, grasses and aquatic weeds. |
| Pentaerythritol | Pentaerythritol is used primarily in the manufacture of the high explosive pentaerythritol tetranitrate and in the production of pharmaceuticals, insecticides, lubricants and paint-swelling agents. |
| Pentane (all isomers) | n-Pentane and isopentane are liquids and neo-pentane is a gas under standard conditions. They are used as aerosol and foam propellants, solvents and in petrol production. Their vapours are denser than air. |
| 2,3-Pentanedione | 2,3-Pentanedione is used as an artificial flavouring for food and beverages, imparting a butter and caramel flavour. It is also used a solvent in paints, inks and lacquers. |
| Peracetic acid | Peracetic acid is used to sterilise reusable medical and dental devices. Commercial uses include oxidising agents, water treatment and beverage and food production. |
| Perchloroethylene | Perchloroethylene is widely used as a dry-cleaning agent and in metal degreasing. Minor uses include as a textile scouring solvent, fumigant, stain remover, paint remover and heat transfer media ingredient. |
| Perchloryl fluoride | Perchloryl fluoride is used as a fluorinating agent in chemical syntheses and can also be used as an insulator for high voltage systems. |
| Phenol | Phenol is used commercially in adhesives, plastics and surface coatings and in the manufacturing of chemicals and pharmaceuticals. |
| m-Phenylenediamine | *m*-Phenylenediamine is used in permanent hair dye preparations. It is also used in dyes for textiles and other materials and as a component of photographic developing. |
| *p*-Phenylenediamine | *p*-Phenylenediamine is used in permanent hair dye preparations. It is also used as a photographic developing agent, in photochemicals and as an intermediate in the manufacture of dyes, antioxidants and rubber accelerators. |
| Phenyl isocyanate | Phenyl isocyanate (PI) is as an intermediate in organic chemical synthesis and in the production of pesticides. In addition, it is used in the paint and photographic industries, in the production of pharmaceutical products, optical brighteners and in textile additives and softeners. |
| Phenyl mercaptan | Phenyl mercaptan is used in the production of polymers, pesticides and pharmaceuticals and as a food additive. |
| Phenylhydrazine | Phenylhydrazine is used in the synthesis of dyes and pharmaceuticals and as a reagent in chemical analysis. Its clinical application was in the treatment of *polycythaemia vera*. However, due to its toxicity, this use has ceased |
| Phosphoric acid | Phosphoric acid is used in fertiliser production and as a pH adjuster in cosmetics. It is formed from the hydrolysis of phosphorus pentoxide or products of phosphorus combustion |
| Phosphorus oxychloride | Phosphorus oxychloride is not a persistent chemical as it completely hydrolyses in water. It is used as an intermediate in the manufacture of numerous products including plastics and elastomers, lubricant oil, surfactants, and sequestrants and organophosphorus pesticides |
| Phosphorus (yellow) | Yellow phosphorus is used in the chemical manufacture of pyrotechnics, explosives and fertilisers. |
| Phthalic anhydride | Phthalic anhydride (PAN) is used in organic synthesis for the manufacture of alkyd and epoxy resins, unsaturated polyesters, dyes, pharmaceuticals, plasticisers and fungicides. |
| Picric acid | Picric acid is used as an explosive, in match and battery manufacturing, in the leather, glass and copper industry, in textiles, as a laboratory chemical and for medicinal purposes. |
| Polyvinyl chloride | Polyvinyl chloride (PVC) is produced through the polymerisation of vinyl chloride. PVC is mainly used in the building and construction industries, automotive parts, consumer goods, packaging and electrical wire insulation. |
| Portland cement | Portland cement is a hydraulic binding material containing cement clinkers (calcium silicates with aluminium and iron) and may contain low-level materials such as silica and hexavalent chromium. Exposure to Portland cement dust is expected to occur mainly in the cement and construction industries. |
| Potassium hydroxide | Potassium hydroxide (KOH) has a variety of uses including in paint and varnish removers, electroplating, photoengraving, drain cleaners, liquid soap manufacture and as a mordant for wood. |
| Propane sultone | Propane sultone was used as a chemical intermediate to introduce sulfopropyl groups into molecules and to confer water solubility and anionic character. No specific Australian use, import or manufacturing information is identified. |
| Propoxur | Propoxur is used as an insecticide. |
| *n*-Propyl nitrate | *n*-Propyl nitrate is used as ignition catalyst for fuel, in the production of rocket fuels and as an intermediate in organic synthesis. |

**Release 14**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Isocyanates, (pol-) (as-NCO) | In this evaluation, the term ‘isocyanates’ has been used for those compounds that possess either 2 (diisocyanates) or 3 (triisocyanates) functional groups, sometimes called polyisocyanates. Monoisocyanates are not subject of this report.  Isocyanates are used in many industries. They are present in external coatings and paints and are used in the production of products such as flexible and rigid foams, adhesives and sealants. In practice, mixtures of different types and different forms of isocyanates are used. |
| Methacrylic acid | Methacrylic acid is used as a monomer in polymer production. |
| Methoxychlor | Methoxychlor is a chlorinated hydrocarbon insecticide used on fruits, vegetables, forage crops and livestock. |
| 2-Methoxyethanol | 2-Methoxyethanol (EGME) is used as a solvent additive in dyes, resins, varnishes and timber stains. Glycol ethers are used as de-icing additives in fuels. Regularly found in material coating and printing industries, pesticides, detergents, plastic and electronics industries. |
| 2-methoxyethyl acetate | 2-methoxyethyl acetate (EGMEA) is used in photographic films, lacquers and textile printing and as a solvent for waxes, oils, various gums and resins, cellulose acetate and nitrocellulose. It has also been used in semiconductor and electronics manufacturing. |
| (2-Methoxymethylethoxy) propanol | (2-Methoxymethylethoxy) propanol is used as hydraulic fluid and as a high boiling solvent. |
| Methylamine | Methylamine is a chemical intermediate used in pharmaceuticals, insecticides, explosives, surfactants and accelerators. |
| Methylcyclohexane | Methylcyclohexane is used in organic synthesis and as a solvent for cellulose ethers and is one of the components of jet fuel. |
| Methylcyclohexanol | Methylcyclohexanol has been used in various applications including as a solvent for cellulose esters and ethers, a lubricant antioxidant and a blending agent for soaps and detergents. It is also used in the textile and artificial silk industry and as a degreasing agent. |
| 1-methyl-2-pyrrolidone | The primary use of 1-methyl-2-pyrrolidone is as a solvent. It is used in a wide range of applications in the paints and petrochemical industries, the microelectronics industry and as a substitute for chlorinated solvents. |
| Methyl silicate | Methyl silicate is used to coat screens of television picture tubes and is used in binders, corrosion-resistant coatings and catalyst preparation and as a silicone intermediate. |
| Nickel carbonyl | Nickel carbonyl is used for nickel vapour plating in the metallurgical and electronics industries and is also used as a catalyst in the synthesis of methyl-and ethyl acrylate monomers. |
| Nickel, metal and insoluble compounds | Major uses of nickel metal and divalent salts include production of stainless steel, corrosion- and heat resistant alloys, catalysts for hydrogenation of fats and oils, electro-plating, coinage and alkaline batteries. This evaluation covers insoluble nickel compounds including nickel metal, nickel powder and sulfide roasting fume and dust. |
| Nickel, soluble compounds | Nickel has been used in the production of stainless steel, corrosion and heat resistant alloys, catalysts for hydrogenation of fats and oils, electroplating, coinage and alkaline (NiCad) batteries.  This evaluation covers soluble nickel compounds including nickel dichloride, nickel dinitrate, nickel sulfate and soluble nickel salts. |
| Nitric acid | Nitric acid is used to dissolve metals and to make nitrates and nitro compounds. |
| Nitric oxide | Nitric oxide (NO) is used in the production of nitric acid for nitrate fertilisers, nitrosyl carbonyl preparation and an intermediate in preparation of nitric acid. It is also used in hospitals as a respiratory stimulant and is produced as a part of exhaust of internal combusions engine. |
| Nitrogen trifluoride | Nitrogen trifluoride is an oxidiser for high-energy fuels and is also used in chemical syntheses. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Nitroglycerine | Nitroglycerine (NG) is used as an explosive and in the treatment of heart disorders. |
| Nitromethane | Nitromethane is used as a chemical stabiliser for halogenated hydrocarbon solvents and aerosol propellants. It is also used as a chemical intermediate, rocket propellant and an explosive when mixed with ammonium nitrate. |
| 1-Nitropropane | 1-Nitropropane is used as a solvent, fuel additive and rocket propellant. |
| 2-Nitropropane | 2-Nitropropane is used as a solvent, in the food industry and as an additive to rocket fuel and explosives. |
| N-nitrosodimethylamine | N-nitrosodimethylamine (DMNA) is used primarily as a research chemical. However, it has also been used as an antioxidant, lubricant’s additive and in the production of rocket fuels. DMNA may be formed as a by-product in the manufacture of cured meats, tobacco, rubber, dyes and in tanneries |
| Pentaborane | Pentaborane is used in ducted jet engines and as a rocket fuel. |
| Pentachloronaphthalene | Pentachloronaphthalene is used in electric wire insulation and as an additive to some lubricants. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| 2,4-pentanedione | 2,4-pentanedione (PD) is used in a range of domestic cleaning and washing agents. It is also used as a metal chelator, lubricant additive and corrosion inhibitor and intermediate in the manufacture of pharmaceuticals and pesticides. |
| Perchloromethyl mercaptan | Perchloromethyl mercaptan is used as an intermediate in the manufacture of dyes and fungicides. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Perlite dust | Perlite is used in thermal insulation, lightweight plasters, as an inert carrier and filler, as concrete aggregate and soil improver |
| Persulfates, ammonium- and alkali metal salts | The persulfate ion is an oxidising agent and its salts are commonly employed in bleaching or etching applications. |
| Petrol (Gasoline) | Petrol is used primarily as a fuel in spark-ignited internal combustion engines. |
| Phenyl glycidyl ether | Phenyl glycidyl ether (PGE) is used in curing agents and epoxy resins. It is an effective stabiliser of halogenated compounds and is used as a solvent for halogenated materials. |
| Phosphine | Phosphine is used as a fumigant and intermediate in pharmaceutical and polymer manufacture. It may be generated from the hydrolysis of metal phosphides. |
| Phosphorus pentachloride | Phosphorus pentachloride is primarily used as a catalyst, chlorinating and dehydrating agent. |
| Phosphorus trichloride | Phosphorus trichloride is primarily used as a chemical intermediate, chlorinating agent, catalyst and a textile finishing agent. |
| m-Phthalodinitrile | m-Phthalodinitrile is used as an intermediate in the manufacture of polyurethane paints and varnishes, plastics and synthetic fibres. It is also used as a firming agent in epoxy resins and in some agricultural chemicals. |
| beta-Propiolactone | β-Propiolactone (BPL) is used as a vapour sterilant for plasma, vaccines, tissue grafts and surgical instruments and as a vapour-phase disinfectant in enclosed spaces. |
| Propranolol | Propranolol is a non-selective beta-blocker that is widely used in pharmaceuticals for hypertension, cardiac arrhythmias, angina pectoris and hyperthyroidism |
| Propylene oxide | Propylene oxide is used as an intermediate for polyether polyols, which are used mainly in the manufacture of polyurethanes. It is also used in paint, lacquer and varnish production, in process regulators, synthetic lubricants and fuel additives and in cleaning agents. |

**Release 15 – Closes 30 July 2021**

| **Substance** | **Use as per descriptor in Evaluation Report**  **(when included)** |
| --- | --- |
| Ethylene glycol (vapour & particulate) | Ethylene glycol is used as antifreeze in heating and cooling systems. It is used in the production of esters and resinous products and frequently used for polyester fibres and resins. |
| Methyl ethyl ketone (MEK) | Methyl ethyl ketone (MEK) is used as a solvent, mainly in coatings, and often in mixtures with acetone, ethyl acetate, *n*-hexane, toluene or alcohols. |
| alpha-Methyl styrene | α-Methylstyrene (AMS) is used as a polymerisation monomer in the manufacture of polyester, resins and other polymers. |
| Mineral spirits | Mineral spirits include mineral turpentines, thinners and white spirits that are petroleum-derived solvents. They are complex hydrocarbon mixtures distinguished by their level of refinement, which primarily determines their aromatic hydrocarbon content in the C6–C12 range. In Australia, mineral turpentine typically contains 40 per cent aromatics, white spirit type 1 contains up to 25 per cent and white spirit type 3 contains less than 1 per cent. Depending on their composition, these products are used as paint thinners, fuel, dry cleaning agents or degreasers. Individual constituents should also be considered when in majority concentration or when the mixture contains more than 0.1% w/w benzene. |
| Monocrotophos | Monocrotophos is used as an insecticide. |
| Nicotine | Nicotine is used as an insecticide, tranquilising agent and therapeutic medicine. |
| Nitrapyrin | Nitrapyrin is primarily used as a fertiliser, bactericide and as a nitrification inhibitor. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| p-Nitroaniline | *p*-Nitroaniline is used in the preparation of dyes, the manufacture of antioxidants, gasoline gum inhibitors and poultry medicines. |
| Nitroethane | Nitroethane is used as a solvent and propellant. |
| 2-Nitrotoluene | 2-Nitrotoluene is used in the manufacture of agricultural chemicals and rubber and in the manufacture of various dyes for wool, silk leather and cotton. |
| 2,2'-Oxybis[ethanol] | 2,2’-Oxybis[ethanol] is used in the manufacture of resins, as a component of anti-freeze, in cosmetic ingredients and in brake fluids and lubricants (ECHA, 2019; NICNAS, 2013). |
| Oxygen difluoride | Oxygen difluoride is used as an oxidiser in rocket propellants. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Ozone | Ozone is used as a disinfectant for air and water, in industrial waste treatment and for bleaching textiles. It is generated in welding arcs and electrical discharges and by ultraviolet radiation. |
| Paraffin wax (fume) | Paraffin is used for making candles, as a sealant or coating for paper and food products, extracting perfumes from flowers and as a chewing gum base. |
| Parathion | Parathion is a broad-spectrum pesticide. However, its use is now banned in Australia. The related methyl parathion (CAS 298-00-0) remains in restricted use. |
| PCBs (42% Chlorine) | Polychlorinated biphenyls (PCB) are used in insulating liquids, synthetic rubber, plasticisers, flame retardants and wide range of similar products. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| PCBs (54% Chlorine) | Polychlorinated biphenyls (PCB) are used in insulating liquids, synthetic rubber, plasticisers, flame retardants, and wide range of similar products. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Pentachloronitrobenzene | Pentachloronitrobenzene (PCNB) is used as a fungicide. |
| Pentachlorophenol | Pentachlorophenol (PCP) is a herbicide, fungicide and an insecticide used to control termites. It is also used to preserve wood. Commercial or technical PCP contains approximately 10% contaminants, primarily polychlorinated phenols, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans and hexachlorobenzene (ACGIH, 2018). |
| Perfluoroisobutylene | Perfluoroisobutylene (PFIB) is a by-product, formed during tetrafluoroethene production and during thermal degradation of polytetrafluoroethene. |
| Perfluorooctanoic acid (PFOA) and its inorganic salts | Perfluorooctanoic acid (PFOA) and its inorganic salts are used in the production of non-stick cookware, fluoropolymer paints, firefighting foams and in weather resistant textile coatings. This evaluation is for perfluorooctanoic acid (PFOA) and its inorganic salts. Evaluation of ammonium perfluorooctanoate (APFO) is included in the APFO report. |
| Phenothiazine | Phenothiazine is used as a pesticide, as a base in the manufacture of tranquilisers, as a urinary antiseptic and in the treatment of pinworm, threadworm and roundworm. |
| Phenyl ether (vapour) | Phenyl ether is used as a heat transfer agent, in perfumery for its geranium-like odour and as a chemical intermediate in the production of surface-active agents and high temperature lubricants |
| Phenylphosphine | Phenylphosphine is used as a chemical reagent and an intermediate. Potential exposures occur when phenylphosphinates are heated above 200˚C. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| N-Phenyl-2-naphthylamine | N-phenyl-b-naphthylamine (PBNA) is used as a rubber antioxidant, antioxidant in grease and oils, stabiliser in the manufacture of dyes and silicone enamels and as a component of rocket fuels. |
| o-Phenylenediamine | *o*-Phenylenediamine is used in manufacturing of chemical substances such as dyes and photographic developing agents (as an intermediate that will be consumed during synthesis) and in manufacturing lubricants and corrosion inhibitors. |
| Phorate | Phorate is used as a contact insecticide and acaricide |
| Phosgene | Phosgene is used as an intermediate in the production of dyes, isocyanates, plastics and pharmaceuticals. It may be formed from chlorinated organic compounds at high temperatures or under UV radiation. |
| Phosphorus pentasulphide | Phosphorus pentasulfide is primarily used as a chemical intermediate, in matches and for introducing sulphur into organic compounds. |
| Picloram | Picloram is a herbicide used for control of woody plants and broadleaf weeds. |
| Pindone | Pindone is an anticoagulant rodenticide and an insecticide |
| Piperazine and salts | Piperazine and its salts are used in veterinary products (worm treatment), as a stabiliser in therapeutic products and as an absorbent for carbon dioxide in research. It is also used in the manufacturing of fibres and polymers to manufacture plastics and resins. |
| Piperidine | Piperidine is used as a solvent and an ingredient in fuels and oils. It is also used as a curing agent for rubber and epoxy resins. |
| Platinum, metal and soluble salts | Platinum is used in the laboratory, in the electronics industry, in the glass industry, in jewellery, for dental and medical uses, and as a catalyst. |
| Polycyclic aromatic hydrocarbon (PAH) mixture when containing benzo[a]pyrene | PAH are formed during the pyrolysis of organic material when heating in the absence of oxygen or incomplete combustion. Relevant pyrolysis products at the workplace include tar, tar vapours, coke oven emissions as well as emissions or soot from the combustion of coal, electrodes and oil. PAH generally do not exist as discrete compounds and instead are found as complex mixtures of many different concentrations and configurations. Benzo[a]pyrene (B[a]P) is a hazardous component of most PAH mixtures. |
| Propoane-1,2-Diol (Total, vapour and particules) | Propane-1,2-diol is used in products such as coolants, brake fluids, solvents and as artificial mist in the entertainment industry and those attending emergency training. |
| Propargyl alcohol | Propargyl alcohol is used in steel production, chemical manufacture, as a corrosion inhibitor, solvent stabiliser and soil fumigant. |
| Propionic acid | Propionic acid is used as a mould inhibitor, fungicide, herbicide, preservative and emulsifier. It is also used in perfumes, drugs, plastics and occurs naturally in cheese. |
| Propyl acetate (all isomers) | Propyl acetates are used as solvents and flavouring agents. |
| Propyl alcohol | Propyl alcohol is used as carrier and extraction solvent for natural products such as flavourings, vegetable oils, resins, waxes and gum. It is used as a cosmetic ingredient. |
| Propylene dichloride | Propylene dichloride is used as a solvent in dry cleaning, paint removers and petrol production. |
| Propylene glycol dinitrate | Propylene glycol dinitrate (PGDN) is used in propellants in torpedo manufacture. |
| Propylene glycol monomethyl ether | Propylene glycol monomethyl ether (PGME) is used as a solvent material in paint and coating processes, inks, cosmetics and cleaning agents used in industrial and domestic applications. |
| Propylene imine | Propylene imine is used as a chemical intermediate in the manufacture of a variety of paper, textile, rubber and pharmaceutical chemicals. |
| Pyrethrum | Pyrethrum is a botanical extract containing pyrethrins, which are used as insecticides. |
| Pyridine | Pyridine is used in manufacture of other chemicals, paints, dyes, adhesives and rubber products and has reported cosmetic and domestic use as a fragrance compound. |
| Quinone | Quinone is primarily used as an intermediate in the production of hydroquinone, dyes, fungicides, as an oxidising agent and as a photographic chemical. |
| Resorcinol | Resorcinol is used as a dye in permanent and semi-permanent hair dyes and as a colour additive and colourant in personal care products. |
| Rhodium, metal and compounds (as Rh) | Rhodium is used in alloys for a range of industrial and commercial applications such as electrical contacts, scientific instruments and jewellery. |
| Ronnel | Ronnel is an organophosphate pesticide used on cattle and as an a systemic antiparasitic in humans. |
| Rosin core solder pyrolysis products (as formaldehyde) | Rosin or colophony is used in flux, welding and soldering agents. Rosin is reported for domestic use as an adhesive and binder. Rosin core solder is measured *via* pyrolysis products and include acetone, aliphatic aldehydes, methyl alcohol, methane, ethane and various abietic acids. |
| Rotenone (commercial) | Rotenone is used as a pesticide. |
| Selenium compounds (as Se) excluding hydrogen selenide | Selenium (Se) is an essential nutrient necessary for amino acid synthesis. Commercial selenium supplies are generated as a by-product of copper ore refinement. It is used in the manufacture of glass, pigments, ceramics, electronics and rubber. |
| Selenium hexafluoride (as Se) | Selenium hexafluoride is used as a gaseous insulator in the electronics industry. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Sesone | Sesone was a commercially used herbicide of which, commercial production has been discontinued. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Silica – Amorphous | Diatomaceous earth is a naturally occurring amorphous silica and is used in agriculture, as an anti-caking agent and in food stuffs. |
| Silicon | Silicon is used in the manufacture of electronics, alloys and polymers. |
| Silicon carbide (fibres) | Silicon carbide (SiC) is used as an artificial abrasive and in the refractory, foundry, ceramic and filler industries. |
| Silicon carbide (non-fibrous dust) | Silicon carbide (SiC) is used as an artificial abrasive and in the refractory, foundry, ceramic and filler industries. |
| Silicon tetrahydride | Silicon tetrahydride is used in the semiconductor industry as a source of pure silicon to form silicon crystals, and specialised thin layers in semiconductors, solar cells and photo cells. |
| Silver and its salts | Silver is used in the production of alloys, jewellery, tableware, photographic, medical materials and electronics. |
| Soapstone |  |
| Sodium azide | Sodium azide forms volatile hydrazoic acid in aqueous solution and is used in chemical synthesis, explosives, rubber, beer production, as a propellant and pesticide. It was formerly used as a vasodilator and disinfectant in medical applications. |
| Sodium bisulphite | Sodium bisulfite is used in the paper, tanning, chemical and food industries. It is also used as an inhibitor of yeast and bacteria in wine making and as a source of sulfur dioxide. |
| Sodium fluoroacetate | Sodium fluoroacetate is used as a pesticide for rodent and predator control. |
| Sodium hydroxide | Sodium hydroxide is a soluble, strong base, used in numerous industries such as pulp and paper, soap and detergents, cellophane and textiles, etching and electroplating. |
| Sodium metabisulphite | Sodium metabisulphite is primarily used as a food preservative and as an antioxidant. |
| Starch | Starch is primarily used in in textiles, printing, mining, adhesives, explosives, cosmetics, food products and as lubricant in surgical gloves. |
| Stearates | Stearates are used in cosmetics, as a stabiliser in plastics (sodium stearate), lubricant and dusting agent for rubber. It is also used to soften polyvinyl chloride (zinc stearate), waxes, pharmaceuticals and waterproofing agents. |
| Stibine | Stibine is used as a fumigant and in semiconductor production. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Strychnine | Salts of strychnine (nitrate, sulphate, phosphate) have been used as rodenticides, in poisoned baits for larger animals and in medicine. |
| Styrene, monomer | Styrene is used in the manufacture of polystyrene plastics, protective coatings, styrenated polyesters, copolymer resins with acrylonitrile and butadiene and as a chemical intermediate. It has also been used in paints, sealers and other surface coatings. |
| Subtilisins (Proteolytic enzymes as 100% pure crystalline enzyme) | Subtilisins are a class of proteolytic enzymes, which are used as active ingredients in detergents. |
| Sucrose | Sucrose is primarily used as a sweetening agent, in fermentation, as a preservative, in the plastics and cellulose industry, and in ink and soaps. |
| Sulfotep | Sulfotep is an organophosphorus insecticide used to control a range of acarine and hemipteran pests. It is used in greenhouses as fumigants. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure |
| Sulphur dioxide | Sulfur dioxide (SO2) is commonly produced in large quantities in major manufacturing industries and frequently released in paper and pulp, metal manufacturing and oil refining. It is also released in food, agriculture and wastewater treatment processes. |
| Sulphur hexafluoride | Sulfur hexafluoride is primarily used as an electrical insulator gas and as a tracer gas for ventilation measurements. |
| Sulphur monochloride | Sulfur monochloride is used in vulcanised rubber, chemical synthesis, wood hardening, textile finishing and gold extraction. |
| Sulphur pentafluoride | Sulphur pentafluoride is produced as a by-product during the synthesis of sulphur hexafluoride. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Sulphur tetrafluoride | Sulfur tetrafluoride is primarily used as a fluorinating agent, in water/oil-repellent materials, lubricity improvers and as an intermediate in the manufacture of pesticides. |
| Sulphuric acid | Sulfuric acid is commonly manufactured and used in the manufacture of chemicals, detergents, dyes, explosives and fertilisers. It is the acid in lead acid batteries and used in metal cleaning and electroplating. |
| Sulfuryl fluoride (Sulphurly) | Sulfuryl fluoride is used as a fumigant insecticide. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Sulprofos | Sulprofos is a contact insecticide. |
| Synthetic mineral fibres (SMF) or Man-made vitreous fibres (MMVF) | Synthetic mineral fibres (SMF) is a collective term used for amorphous vitreous fibres such as glass fibre, rock wool, slag wool and refractory ceramic fibres (RCF). Continuous glass filament is used as reinforcement in plastics and building products and in industrial fabrics. Glass wool and rock wool are used extensively in thermal and acoustic building insulation products. RCF are used primarily in industry as insulation for high-temperature applications such as furnaces, boilers and other heating equipment subjected to elevated temperatures |
| 2,4,5-T | 1,1,1-Trichloroethane is used in chemical manufacture and as a solvent for adhesives and metal degreasing. |
| Talc, (containing no asbestos fibres) | Talc is a mineral product with composition varying between geological deposits. The trade product may also contain various impurities. It is used extensively in a variety of industrial products (ceramics and pharmaceuticals) and cosmetics. |
| Tantalum, metal & oxide dusts | Tantalum metal is used in electric capacitors, chemical equipment, rectifiers, furnace components, high-speed tools, body implants and electronic circuitry. The oxide of tantalum is employed in making optical glass and has piezoelectric, maser and laser applications. |
| Tellurium & compounds (as Te) | Elemental tellurium (Te) is used as an additive to copper, iron and steel and in vulcanising rubber. It is also used as a colouring agent in glass and ceramics, in thermoelectric devices and in storage batteries. Certain telluride alloys are employed in the semiconductor industry.  Note this assessment excludes hydrogen telluride and tellurium hexafluoride. |
| Tellurium hexafluoride (as Te) | No uses of tellurium hexafluoride have been found. It is a by-product of ore refining. |
| Temephos | Temephos is an organophosphate pesticide (larvicide). |
| TEPP | Tetraethyl pyrophosphate (TEPP) is an organophosphorus (OP) pesticide used to control aphids, spiders, mites and other insects. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Terephthalic Acid | Terephthalic acid is used in the production of polyterphthalic acid esters, as a reagent for alkali in wool and in poultry feeds. |
| Terphenyls | Terphenyls are primarily used as a heat storage and transfer agent, textile dye carrier, lubricants, sunscreen and in synthesis of partially hydrogenated terphenyls. |
| 1,1,2,2-Tetrabromoethane | 1,1,2,2-tetrabromoethane (tetrabromoethane) is used as a solvent, gauge fluid, refractive index liquid in microscopy and in other industrial uses. |
| 1,1,2,2-Tetrachloro-1,2-difluoroethane | 1,1,2,2-Tetrachloro-1,2-difluoroethane is used primarily as a refrigerant, in dry-cleaning, as a blowing or foaming agent, a solvent extractant, and a corrosion inhibitor. |
| 1,1,1,2-Tetrachloro-2,2-difluoroethane | 1,1,1,2-Tetrachloro-2,2-difluoroethane is used primarily as a refrigerant, blowing agent, solvent and corrosion inhibitor. |
| 1,1,2,2-Tetrachloroethane | 1,1,2,2-Tetrachloroethane (1,1,2,2-TCA) was widely used as a solvent and chemical intermediate in the manufacture of trichloroethene and tetrachloroethene. |
| Tetrachloronaphthalene | Tetrachloronaphthalene is primarily used in electrical insulation material, in resins, polymer coatings and an additive in cutting oils and lubricant. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Tetraethyl lead (as Pb) | Tetraethyl lead (TEL) is used as a fuel additive and in the production of aviation fuel. |
| 1,1,1,2-Tetrafluoroethane | 1,1,1,2-Tetrafluoroethane is the most common hydrofluorocarbon (HFC) refrigerant gas used in Australia and is also used as a propellant in medical aerosols, as a foam in fire suppression applications and aerosols (NICNAS, 2014). |
| Tetrafluoroethylene | Tetrafluoroethylene (TFE) is a highly flammable gas at room temperature. It is primarily used in the synthesis of polytetrafluoroethylene polymers. It is also used in a variety of end products including those for indirect or direct food contact. |
| Tetrahydrofuran | Tetrahydrofuran (THF) is a solvent for natural and synthetic polymers and resins and is used as a monomer for the manufacture of polytetramethyleneoxide. It is used in the manufacture of lacquers, glues, paint, dyes, ink, adhesives, PVC pipe cement and magnetic tape. |
| Tetramethyl lead (as Pb) | Tetramethyl lead (TML) has been used as a fuel additive and in the production of aviation fuel. |
| Tetramethyl succinonitrile | Tetramethyl succinonitrile (TMSN) is a by-product during the production of vinyl foam and from its use as a polymerisation catalyst in photocopier toner. |
| Tetranitromethane | Tetranitromethane (TNM) is used as an oxidizing agent in rocket propellants and explosives, an additive in diesel fuel to increase octane rating and as a reagent for nitration of tyrosine in proteins and peptides. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| Tetrasodium pyrophosphate | Tetrasodium pyrophosphate is used in the food industry as an emulsifier and dental industry as a calcium-chelating salt. |
| Tetryl | Tetryl is used as an explosive in detonators and primers and may also be employed as an explosive charge. |
| Thallium, soluble compounds (as Tl) | Thallium is used in the electronics and semiconductor industries; some of its soluble salts were formerly used as pesticides. It is present in certain flue dusts and ashes, which may be used in the manufacture of cement and bricks. |
| 4,4'-Thiobis (6-tert-butyl-m-cresol) | 4,4'-Thiobis (6-tert-butyl-m-cresol) is used as an additive in rubbers, adhesives, and plastics. |
| Thioglycolic acid | Thioglycolic acid is used in hair care products, as pharmaceuticals and process intermediates and thioglycolates are used in bacteriology. |
| Thionyl chloride | Thionyl chloride is primarily used as a chlorinating agent and as a solvent. |
| Thiram | Thiram is used as a fungicide, rubber vulcaniser and bacteriostat in soap. |
| Tin, organic compounds (as Sn) | Organometallic tin compounds or organotins, are those compounds having at least one covalent carbon–tin bond. Organotins are numerous, existing in both the alkyl and aryl classes, each of which include mono, di-, tri- and tetra-derivatives. They are used commercially in three major applications: thermal and light stabilisers for polyvinyl chloride (PVC) polymers; catalysts for a variety of chemical reactions including the production of polyurethane foams; and industrial and agricultural biocides such as antifouling paints and disinfectants on surfaces such as hospital floors. |
| Tin (metal and inorganic compounds) | Metallic tin is processed to yield tin foil or solder and is used in the manufacture of numerous alloys such as bronze. Because of its resistance to corrosion, tin is used as a protective coating for other metals. Another important property of tin is its ability to form alloys with other metals. Thus, tin metal is commonly used in tin plating, manufacture of food cans and solder and alloy production. Dental amalgams contain varying proportions of tin. |
| Titanium dioxide | Titanium dioxide (TiO2) is used as a pigment, additive in the production of polymers, electronics and pharmaceuticals and food colourant. The two most commonly used forms in industry are derived from the rutile or anatase mineral. |
| o-Tolidine | *o*-Tolidine is used in the production of dyes and in analytical chemistry. |
| Toluene | Toluene is generated during the process of refining crude oil. It is a component of gasoline and rubber. It is also used as a solvent and to produce other compounds such as plastic. |
| m-Toluidine | *m*-Toluidine and its hydrochloride (HCl) salt are used as intermediates in dye and chemical manufacture. |
| o-Toluidine | *o*-Toluidine and its hydrochloride (HCl) salt are used in the manufacture of dyes, rubber, pesticides and pharmaceuticals. |
| p-Toluidine | *p*-Toluidine and its hydrochloride salt are used as intermediates in dye and chemical manufacture. |
| Tributyl phosphate | Tributyl phosphate is used as a flame retardant and solvent in mineralogical applications. |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 1,1,2-Trichloro-1,2,2-trifluoroethane is used as a refrigerant and solvent for degreasing and in dry‑cleaning applications. |
| Trichloroacetic acid | Trichloroacetic acid (TCA) is used as an etching agent, therapeutic peeling agent and in chemical manufacture. |
| 1,2,4-Trichlorobenzene | 1,2,4-Trichlorobenzene is primarily used as a dielectric fluid, heat transfer medium and in lubricants, insecticides and organic synthesis. |
| 1,1,1-Trichloroethane | 1,1,1-Trichloroethane is used in chemical manufacture and as a solvent for adhesives and metal degreasing. |
| 1,1,2-Trichloroethane | 1,1,2-Trichloroethane is used in the production of vinylidene chloride and as a solvent. |
| Trichloroethylene | Trichloroethylene (TCE) is mainly used for vapour degreasing and cleaning of metal parts, in adhesives, as a solvent and for synthesis in the chemical industry. |
| Trichlorofluoromethane | Trichlorofluoromethane (CFC-11) has been used as a blowing agent in polyurethane foam production, as a refrigerant, solvent and heat transfer medium. |
| Trichloronaphthalene | Trichloronaphthalene is primarily used in lubricant and insulation for electrical wire. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure. |
| 1,2,3-Trichloropropane | 1,2,3-Trichloropropane is used in the chemical industry as an intermediate in the synthesis of other chemicals. |
| Triethanolamine | Triethanolamine is used in dry cleaning and wool scouring. It is found in cosmetics, household detergents, metalworking fluids, polishes, emulsions, antifoam agents, water repellents and similar products. |
| Triethylamine | Triethylamine is used in the production of pharmaceuticals, pesticides, resins and polyurethane foam. |
| Trifluorobromomethane | Trifluorobromomethane has been used as a fire extinguisher and chemical intermediate. |
| Triglycidylisocyanurate (TGIC) | Triglycidylisocyanurate (TGIC) is used as a powder coating resin. |
| Trimellitic anhydride | Trimellitic anhydride is used in the manufacture of plastics, resins, plasticisers and various coatings. |
| Trimethylamine | Trimethylamine (TMA) is used as an insect attractant, as a warning agent in natural gas, as a flotation agent and as an intermediate in chemical synthesis. It is a natural decomposition product of nitrogenous plant and animal macromolecules and is widely distributed in animal tissue, especially fish. |
| 2,4,5-Trimethylaniline | 2,4,5-Trimethylaniline is used in the chemical manufacture of dyes. |
| Trimethylbenzene (all isomers) | Trimethylbenzenes (TMB) are a commercially available mixture of three individual isomers which are produced during petroleum refining and production of aromatic hydrocarbons with nine carbons (i.e. C9 aromatic fraction). They have been used as raw materials in chemical syntheses and as ultraviolet stabilisers in plastics. |
| Trimethyl phosphite | Trimethyl phosphite (TMP) is used as an intermediate in the manufacture of pesticides and flame-retardant polymers and as a fireproofing agent in the production of textiles. |
| 2,4,6-Trinitrotoluene (TNT) | 2,4,6-Trinitrotoluene (TNT) is used as a high explosive that must be detonated by a high-velocity initiator or efficient concussion. |
| Triorthocresyl phosphate | Triorthocresyl phosphate (TOCP) is used as a flame retardant and plasticiser, as a fuel additive to control pre-ignition, in hydraulic fluids, a synthetic lubricant and waterproofing agent. |
| Triphenyl amine | Triphenyl amine is used as a photoconductor and in film manufacturing. |
| Triphenyl phosphate | Triphenyl phosphate (TPP) is used as a plasticiser in vehicle upholstery, fireproofing agent, component of lubricating oil and hydraulic fluids. |
| Tungsten, soluble and insoluble compounds (as W) | Tungsten (W) is used in the production of several alloys such as the chromium, cobalt and tungsten alloy used for cutting tools. It is also used for filaments in incandescent lamps, heating elements and welding electrodes. |
| Turpentine (wood) | Turpentine is a mixture of monoterpenes, mainly α-pinene, β-pinene and Δ3-carene, predominately from resins in pine trees. It is used as a solvent, paint thinner, cleaner and antiseptic and is released as a vapour during wood processing. |
| Uranium (natural), soluble & insoluble compounds (as H) | Uranium is used in electric power generation and in the production of paints and certain ammunition. |
| Urethane | Urethane is used as an intermediate in textile resins and pharmaceuticals and as a solubilising agent in the manufacture of pesticides and cosmetics. It is not used in the production of polyurethane foams and coatings, nor is it released upon their decomposition. |
| n-Valeraldehyde | N-Valeraldehyde is used as a flavouring agent, in resin chemistry and as a rubber accelerator. |
| Vanadium (as V2O5), (respirable dust & fume) | Vanadium is encountered in the workplace during the maintenance of oil-fired burners (as pentoxide), including residues from vanadium containing oils. It is also used as a catalyst and in the manufacture of alloys, glass, ceramics, textiles dyes and photography developer. |
| Vegetable oil mists (except castor oil, cashew nut or similar irritant oils) | Vegetable oil mist is a naturally derived oil from a seed or fruit and are used as a lubricant, emulsifier, and in cooking oil sprays mixed with a propellant. |
| Vinyl acetate | Vinyl acetate is used as an emulsifier in polymer, ink, adhesive, paint, textile and paper production. |
| Vinyl bromide | Vinyl bromide is used primarily in polymers as a flame retardant in the production of acrylic fibres for carpet-backing material. It is also used as an intermediate in organic synthesis and in the manufacture of polymers, copolymers, flame retardants, pharmaceuticals and fumigants. |
| Vinyl chloride, monomer | Vinyl chloride is used primarily in the manufacture of polyvinyl chloride (PVC). It has also been employed in organic syntheses and in production of vinyl chloride–vinyl acetate copolymers. |
| 4-Vinyl Cyclohexene | 4-Vinyl cyclohexene (VCH) is used as an intermediate in the manufacture of other chemicals such as polyolefins, flame retardants, fragrances and solvents. No specific Australian use, import, or manufacturing information has been identified. |
| Vinyl cyclohexene dioxide | No specific Australian use, import, or manufacturing information for vinyl cyclohexane dioxide (VCD) is identified (NICNAS, 2016). International use includes as a reactive diluent for other diepoxides, producing epoxy resins for coatings, adhesives and inks and formulating encapsulants for various electrical applications. |
| N-Vinyl-2-pyrrolidone | N-vinyl-2-pyrrolidone is used in polymer and pharmaceutical production. |
| Vinyl toluene | Vinyl toluene is used as an intermediate in the manufacture of plastics, coatings and insecticides. |
| Vinylidene chloride | Vinylidene chloride is used as a monomer in the production of thermoplastics and synthetic textiles. |
| Vinylidene Fluoride | Vinylidene fluoride (VDF) is used as an intermediate in chemical synthesis, primarily production of elastomeric copolymers and polyvinylidene fluoride. |
| Warfarin | Warfarin is used as a therapeutic anticoagulant and rodenticide. |
| Welding fumes (not otherwise classified) | Welding fumes are produced as by-products of the welding process. |
| Wood dust | The characteristics of different woods, e.g. hard- or softwood types, depend on the species of tree from which they are produced. Different types of wood are commonly encountered together during processing (ACGIH, 2018). Wood dust exposure occurs primarily in processing industries including logging operations, sawmills, pulp mills, and furniture, cabinet, and other wood product manufactories. |
| Xylene (o-, m-, p- isomers) | Mixed xylene is present in petrol and aviation fuel and in many petroleum solvents and is used as a solvent in paints and other coatings and in rubber cements. |
| m-Xylene-alpha,alpha'-diamine | m-Xylene-alpha,alpha'-diamine (MXDA) is used as a source for the production of polyamide fibres and resins. It is also used as a starting chemical for the synthesis of m-xylene diisocyanate and as a curing agent for epoxy resins. |
| Xylidine (all isomers) | Xylidine isomers are present as mixtures in raw materials used in the manufacture of dyes and pharmaceuticals. |
| Yttrium, metal & compounds (as Y) | Yttrium is used in nuclear technology, metal alloys, coatings and lasers. |
| Zinc chloride (fume) | Zinc chloride is an inorganic corrosive salt used in soldering flux, iron galvanising, textiles, adhesives, deodorants, embalming fluids, organic syntheses, petroleum refining and as a wood preservative and electrolyte in dry cell batteries. It is also used in smoke bombs and screening smokes. |
| Zinc oxide (fume & dust) | Zinc oxide is widely used in pigments, rubber, cosmetics and ointments and electronic devices. Occupational exposure to zinc oxide may occur during its manufacture (dust) or through its formation as a fume as a result of subjecting zinc or zinc containing alloys to elevated temperatures such as welding. |
| Zirconium compounds (as Zr) | Zirconium compounds are used in nuclear technology, photography, high-vacuum and medical applications and ceramic and coatings manufacture. |