# Table A – Prohibited carcinogens

(From Table 10.1 in Schedule 10 to the model WHS Regulations)

|  |  |  |
| --- | --- | --- |
| **Item** | **Prohibited carcinogen** | **CAS number** |
| 1 | 2-Acetylaminofluorene | 53-96-3 |
| 2 | Aflatoxins | N/A |
| 3 | 4-Aminodiphenyl | 92-67-1 |
| 4 | Benzidine and its salts (including benzidine dihydrochloride) | 92-87-5  531-85-1 |
| 5 | bis(Chloromethyl) ether | 542-88-1 |
| 6 | Chloromethyl methyl ether (technical grade which contains bis(chloromethyl) ether) | 107-30-2 |
| 7 | 4-Dimethylaminoazobenzene (Dimethyl Yellow) | 60-11-7 |
| 8 | 2-Naphthylamine and its salts | 91-59-8 |
| 9 | 4-Nitrodiphenyl | 92-93-3 |

# Table B – Restricted carcinogens

(From Table 10.2 in Schedule 10 to the model WHS Regulations)

| **Item** | **Restricted carcinogen** | **CAS number** | **Uses that require authorisation by a WHS regulator** |
| --- | --- | --- | --- |
| 1 | Acrylonitrile | 107-13-1 | All |
| 2 | Benzene | 71-43-2 | All uses involving benzene as a feedstock containing more than 50% of benzene by volume  Genuine research or analysis |
| 3 | Cyclophosphamide | 50-18-0 | When used in preparation for therapeutic use in hospitals and oncological treatment facilities, and in manufacturing operations  Genuine research or analysis |
| 4 | 3,3'-Dichlorobenzidine and its salts (including 3,3'-Dichlorobenzidine dihydrochloride) | 91­-94-1  612-83-9 | All |
| 5 | Diethyl sulfate | 64-67-5 | All |
| 6 | Dimethyl sulfate | 77-78-1 | All |
| 7 | Ethylene dibromide | 106-93-4 | When used as a fumigant  Genuine research or analysis |
| 8 | 4,4'-Methylene bis(2-chloroaniline)  (MOCA) | 101-14-4 | All |
| 9 | 3-Propiolactone (Beta-propiolactone) | 57-57-8 | All |
| 10 | o-Toluidine and  o-Toluidine hydrochloride | 95-53-4  636-21-5 | All |
| 11 | Vinyl chloride monomer | 75­01-4 | All |

# Table C – Restricted hazardous chemicals

(From Table 10.3 in Schedule 10 to the model WHS Regulations)

| **Item** | **Restricted hazardous chemical** | **Uses not permitted unless an exemption from a WHS regulator has been granted** |
| --- | --- | --- |
| 1 | Antimony and its compounds | For abrasive blasting at a concentration of greater than 0·1% as antimony |
| 2 | Arsenic and its compounds | For abrasive blasting at a concentration of greater than 0·1% as arsenic  For spray painting |
| 3 | Benzene (benzol), if the substance contains more than 1% by volume | For spray painting |
| 4 | Beryllium and its compounds | For abrasive blasting at a concentration of greater than 0·1% as beryllium |
| 5 | Cadmium and its compounds | For abrasive blasting at a concentration of greater than 0·1% as cadmium |
| 6 | Carbon disulphide (carbon bisulphide) | For spray painting |
| 7 | Chromate | For wet abrasive blasting |
| 8 | Chromium and its compounds | For abrasive blasting at a concentration of greater than 0·5% (except as specified for wet blasting) as chromium |
| 9 | Cobalt and its compounds | For abrasive blasting at a concentration of greater than 0·1% as cobalt |
| 10 | Free silica (crystalline silicon dioxide) | For abrasive blasting at a concentration of greater than 1% |
| 11 | Lead and compounds | For abrasive blasting at a concentration of greater than 0·1% as lead or which would expose the operator to levels in excess of those set in the regulations covering lead |
| 12 | Lead carbonate | For spray painting |
| 13 | Methanol (methyl alcohol), if the substance contains more than 1% by volume | For spray painting |
| 14 | Nickel and its compounds | For abrasive blasting at a concentration of greater than 0·1% as nickel |
| 15 | Nitrates | For wet abrasive blasting |
| 16 | Nitrites | For wet abrasive blasting |
| 17 | Radioactive substance of any kind where the level of radiation exceeds 1 Bq/g | For abrasive blasting, so far as is reasonably practicable |
| 18 | Tetrachloroethane | For spray painting |
| 19 | Tetrachloromethane (carbon tetrachloride) | For spray painting |
| 20 | Tin and its compounds | For abrasive blasting at a concentration of greater than 0.1% as tin |
| 21 | Tributyl tin | For spray painting |

# Table D – Hazardous chemicals requiring health monitoring

(From Tables 14.1 and 14.2 in Schedule 14 to the model WHS Regulations)

| **Hazardous chemicals (other than lead) requiring health monitoring** | | |
| --- | --- | --- |
| **Item** | **Hazardous chemical** | **Type of health monitoring** |
| 1 | Acrylonitrile | Demographic, medical and occupational history Records of personal exposure Physical examination |
| 2 | Arsenic (inorganic) | Demographic, medical and occupational history  Records of personal exposure Physical examination with emphasis on the peripheral nervous system and skin  Urinary inorganic arsenic |
| 3 | Benzene | Demographic, medical and occupational history  Records of personal exposure  Physical examination Baseline blood sample for haematological profile |
| 4 | Cadmium | Demographic, medical and occupational history  Records of personal exposure  Physical examination with emphasis on the respiratory system  Standard respiratory questionnaire to be completed  Standardised respiratory function tests including for example, FEV1, FVC and FEV1/FVC  Urinary cadmium and β2-microglobulin  Health advice, including counselling on the effect of smoking on cadmium exposure |
| 5 | Chromium (inorganic) | Demographic, medical and occupational history  Physical examination with emphasis on the respiratory system and skin  Weekly skin inspection of hands and forearms by a competent person |
| 6 | Creosote | Demographic, medical and occupational history  Health advice, including recognition of photosensitivity and skin changes  Physical examination with emphasis on the neurological system and skin, noting any abnormal lesions and evidence of skin sensitisation  Records of personal exposure, including photosensitivity |
| 7 | Crystalline silica | Demographic, medical and occupational history  Records of personal exposure  Standardised respiratory questionnaire to be completed  Standardised respiratory function test, for example, FEV1, FVC and FEV1/FVC  Chest X-ray full size PA view |
| 8 | Isocyanates | Demographic, medical and occupational history  Completion of a standardised respiratory questionnaire  Physical examination of the respiratory system and skin  Standardised respiratory function tests, for example, FEV1, FVC and FEV1/FVC |
| 9 | Mercury (inorganic) | Demographic, medical and occupational history  Physical examination with emphasis on dermatological, gastrointestinal, neurological and renal systems  Urinary inorganic mercury |
| 10 | 4,4'-Methylene bis (2-chloroaniline) (MOCA) | Demographic, medical and occupational history  Physical examination  Urinary total MOCA  Dipstick analysis of urine for haematuria  Urine cytology |
| 11 | Organophosphate pesticides | Demographic, medical and occupational history including pattern of use  Physical examination  Baseline estimation of red cell and plasma cholinesterase activity levels by the Ellman or equivalent method  Estimation of red cell and plasma cholinesterase activity towards the end of the working day on which organophosphate pesticides have been used |
| 12 | Pentachlorophenol (PCP) | Demographic, medical and occupational history  Records of personal exposure  Physical examination with emphasis on the skin, noting any abnormal lesions or effects of irritancy  Urinary total pentachlorophenol  Dipstick urinalysis for haematuria and proteinuria |
| 13 | Polycyclic aromatic hydrocarbons (PAH | Demographic, medical and occupational history  Physical examination  Records of personal exposure, including photosensitivity  Health advice, including recognition of photosensitivity and skin changes |
| 14 | Thallium | Demographic, medical and occupational history  Physical examination  Urinary thallium |
| 15 | Vinyl chloride | Demographic, medical and occupational history  Physical examination  Records of personal exposure |
| **Lead requiring health monitoring** | | |
| **Item** | **Lead** | **Type of health monitoring** |
| 1 | Lead (inorganic) | Demographic, medical and occupational history  Physical examination  Biological monitoring |

# Table E - Non-threshold genotoxic carcinogens identified through the review of the *Workplace exposure standards for airborne contaminants*

|  | **NTGC** | **CAS number** | **Known uses/process** | **Relevant industries** | **Has a workplace exposure standard? (A)** | **Listed in Schedule 10? (A)** | **Listed in Schedule 14? (B)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | Acrylamide | 79-06-1 | Used industrially to synthesise polyacrylamide. Also used in production of dyes, organic compounds, ore processing and in textile manufacturing. Often a pre-cursor or an intermediate in these reactions. | Various. Notably chemical manufacturing, mining, and textiles. | Yes | No | No |
| **2** | Acrylonitrile  (Vinyl cyanide) | 107-13-1 | Used as a precursor or intermediate for synthesising polymers for industrial synthetic rubbers, and separating fatty acids and vegetable oils | Various. | Yes | Yes - 10.2 (restricted carcinogen) | Yes |
| **3** | Allyl chloride  (3-Chloro-1-propene) | 107-05-1 | Allyl chloride is often found as a chemical intermediate in many industries. It is used in the preparation of polymers and plastics, oil production, pharmaceuticals, and catalysts. | Various. | Yes | No | No |
| **4** | Allyl glycidyl ether  (AGE, Allyl 2,3-epoxypropyl ether) | 106-92-3 | Often used as a monomer to synthesise different types of polymers. It is normally used in preparation for resins and rubber. | Various. | Yes | No | No |
| **5** | Anisidine (o, p- isomers)  (Methoxyaniline) | 29191-52-4 | See specific isomers below. | | | | |
| **6** | o-Anisidine | 90-04-0 | Manufacturing of dyes - it is nitrated to give 4-nitroaniside. A precursor for heartwood indicator. | Various | Yes (if captured by Anisidine,  o-, p- isomers) | No | No |
| **7** | p-Anisidine | 104-94-9 | Used in the manufacturing of azo dyes (R-N=N-R') functional group. Also used for biomedical research purposes. | Various | Yes (if captured by Anisidine,  o-, p- isomers) | No | No |
| **8** | Benzidine | 92-87-5 | Synthetical chemical used in the production of textiles, paints, inks, and pharmaceuticals. It also has uses in the test for blood in faeces. | Textiles and pharmaceuticals | No | Yes - 10.1 (prohibited carcinogen) | No |
| **9** | (bis)chloromethyl ether | 542-88-1 | NIL | Unknown | Yes | Yes - 10.1 (prohibited carcinogen) | No |
| **10** | 1,3-Butadiene | 106-99-0 | Principally used in the manufacture of automobile tyres. A precursor for the main polymer to manufacture tyres. | Automotive | Yes | No | No |
| **11** | Catechol  (Pyrocatechol, o-Dihydroxybenzene) | 120-80-9 | Used in the production of pesticides and as a precursor for perfumes and pharmaceuticals. | Various | Yes | No | No |
| **12** | beta-Chloroprene  (2-Chloro-1,3-butadiene) | 126-99-8 | Used as a monomer/precursor to produce polychloroprene, a synthetic rubber. | Various | Yes | No | No |
| **13** | Chromium VI compounds (including zinc chromates) | Various, includes  7440-47-3  (Cr metal), 18540-29-9  (Cr (VI)) and others (>30) | Primarily used as pigments in dyes, paints, inks, and plastics. | Various | Yes | Yes - 10.3 (restricted hazardous chemical) | Yes |
| **14** | Coal tar pitch volatiles  (as benzene solubles) | 65996-93-2 | Liberated in the processing of coal in power stations. | Energy and others | Yes | No | No |
| **15** | 1,2-Dibromo ethane (ethylene dibromide) | 106-93-4 | Used as an "anti-knock' additive in leaded fuels - increases the fuel’s octane rating. Also used as a fumigant, in waterproofing, dyes, and as resins. | Energy and others | No | Yes - 10.2 (restricted carcinogen) | No |
| **16** | 3,3'-Dichlorobenzidine | 91-94-1 | Used in the production of yellow pigments in printing inks. | Textiles | No | Yes - 10.2 (restricted carcinogen) | No |
| **17** | Diethyl sulfate | 64-67-5 | Liberated as an intermediate in the processing of dyes. | Textiles | No | Yes - 10.2 (restricted carcinogen) | No |
| **18** | Dimethylcarbamoyl chloride | 79-44-7 | Liberated as an intermediate in the processing of dyes and in pharmaceuticals. | Various | No | No | No |
| **19** | Dimethyl sulfate | 77-78-1 | Precursor in the synthesis of pharmaceuticals, and dyes. | Pharmaceutical | Yes | Yes - 10.2 (restricted carcinogen) | No |
| **20** | Dinitrotoluene | 25321-14-6 | Used as a plasticiser or burn rate modifier in propellants. Increases the elasticity of the propellant mixture, solidifying it to an extent | Various | Yes | No | No |
| **21** | Ethylene dichloride  (1,2-Dichloroethane) | 107-06-2 | Used as a precursor to produce vinyl chloride monomer, which is then used to synthesise the polymerisation of PVC and VCM | Various | Yes | No | No |
| **22** | Ethylene oxide  (Oxirane) | 75-21-8 | Used as a precursor to synthesise other chemicals in various industries. Sterilisation of medical equipment | Various | Yes | No | No |
| **23** | Ethylenimine  (Aziridine) | 151-56-4 | Intermediate in the production of triethylene-melamine. It can also be polymerised to poly ethylenimine. | Various | Yes | No | No |
| **24** | Hydrazine  (Diamine) | 302-01-2 | Precursor in the synthesis of pharmaceuticals and dyes. Also, it can be used to make catalysts for rockets | Explosives/propellants | Yes | No | No |
| **25** | Lead chromate (as Cr) | 7758-97-6 | Primarily used as a pigment in paints. Also used in the ceramic manufacturing industry | Chemical manufacturing | Yes | Yes - 10.3 (restricted hazardous chemical) | No |
| **26** | 4,4’-Methylene bis(2-chloroaniline)  (MOCA, MBOCA, 2,2'-Dichloro-4,4'-methylenedianiline) | 101-14-4 | Curing agent in polyurethane production | Plastics | Yes | Yes - 10.2 (restricted carcinogen) | Yes |
| **27** | 2-Nitrotoluene | 88-72-2 | Generally used as a precursor or derivative for the precursor of azo dyes | Various | Yes | No | No |
| **28** | Propane sultone | 1120-71-4 | Precursor and an intermediate in the production of dyes and insecticides | Various | No | No | No |
| **29** | Polycyclic aromatic hydrocarbon (PAH) mixture when containing benzo[a]pyrene | 50-32-8 (benzo[a]pyrene) | Liberated through the incomplete combustion or pyrolysis of coal and other organic material | Various | No | No | Yes |
| **30** | Tetranitromethane  (TNM) | 509-14-8 | Oxidising agent with applications in rocketry and additive to diesel fuel | Various | Yes | No | No |
| **31** | Urethane | 51-79-6 | Used in liquid form as a coating and adhesive. Also used as a plasticiser in plastics and explosives | Various | No | No | No |
| **32** | Vinyl bromide  (Bromoethylene) | 593-60-2 | Precursor for the manufacturing of flame retardant synthetic fibres | Various | Yes | No | No |
| **33** | Vinyl chloride, monomer  (Chloroethylene) | 75-01-4 | Used in the polymerisation reaction to synthesise polyvinyl chloride (PVC) | Used in the polymerisation reaction to synthesise polyvinyl chloride (PVC) | Yes | Yes - 10.2 (restricted carcinogen) | Yes |

*Footnote (A)*

Model WHS Regulations 49 and 50.

*Footnote (B)*

Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals(model WHS Regulations 340 and 380–384)

*Note: The prohibition of the use of carcinogens listed in table 10.1, column 2 and the restriction of the use of carcinogens listed in table 10.2, column 2 apply to the pure substance and where the substance is present in a mixture at a concentration greater than 0·1%, unless otherwise specified.*

* Table 10.1 Prohibited carcinogens
* Table 10.2 Restricted carcinogens
* Table 10.3 Restricted hazardous chemicals

*Footnote (C)*

Schedule 14: Requirements for health monitoring(model WHS Regulations 368, 370 and 406)