



Cyanide - Information on handling, storage and hazards

This fact sheet provides information on the legislation covering cyanide in Western Australia as well as safe handling, storage, disposal, health effects, first aid and safety issues relating to fires involving cyanide.

Consulting with employees

If cyanide is used at your workplace there should be agreed procedures to reduce or eliminate the risk of injury and disease. Employers should consult with employees and safety and health representatives to develop the appropriate procedures and training necessary to protect employees and provide for a safe and healthy workplace as required in the *Occupational Safety and Health Act 1984* (OSH Act).

What is cyanide?

Cyanide is a rapidly acting, poisonous chemical that can exist as a solid, solution (liquid) or gas. All forms of cyanide are poisonous.

Cyanide salts are used in metallurgy, mainly gold extraction, electroplating and metal cleaning. In manufacturing cyanide is used to make paper, textiles and plastics.

Why is cyanide a dangerous substance?

Cyanide is a fast acting poison in the human body. It affects our ability to use the oxygen we breathe. Severe breathing difficulties develop very rapidly when cyanide is swallowed, inhaled or absorbed through the skin. Highly poisonous cyanide gas can be produced when cyanide solids or liquids are mixed with moisture in air, or with steam, acid, acid fumes or if air is bubbled through a cyanide solution. Cyanide gas has an odour of bitter almonds. Many people are unable to detect its odour and therefore have no warning of its presence. Those who can detect the odour of cyanide gas can detect it above a concentration of around 0.6ppm.

Cyanide gas is highly flammable and reacts violently in some situations (eg a large amount of cyanide gas mixed with air may suddenly explode). There is an extremely high risk of explosion if cyanides are exposed to heat or flames. Safety procedures are aimed at preventing the substance from entering the human body and avoiding situations where cyanide solids or liquids might react to produce the highly poisonous and flammable cyanide gas.

Legal requirements

The *Occupational Safety and Health Act 1984* places certain duties on employers, employees, self-employed people, manufacturers, importers and suppliers with the objective of preventing occupational injuries and diseases. The broad duties established by the OSH Act are supported further through the Occupational Safety and Health Regulations 1996, which provide specific requirements related to specific hazards, such as hazardous substances. This applies to the handling of cyanide at WA workplaces.

The use, handling and storage of cyanide in Western Australia is governed by the *Poisons Act 1964* administered by the Department of Health. Cyanide is a substance specified in the Seventh Schedule to the Act. A licence or permit is required for the purchase, sale and use of cyanide from the [Department of Health](#), telephone (08) 9222 6883.

Information on cyanide disposal can be obtained from the Department of Environment Regulation, telephone (08) 6467 5000.

Bulk storage and transport is regulated by the Resources Safety Division of the [Department of Mines and Petroleum](#) under the Dangerous Goods legislation.

Cyanide in Western Australia is mostly used in the mining industry. Queries in relation to mine sites should be directed to Resources Safety, [Department of Mines and Petroleum](#), telephone (08) 9358 8001.

Other workplaces may contact WorkSafe via email safety@commerce.wa.gov.au or telephone 1300 307 877.

Handling

Employers must:

- provide safety data sheets (kept in a hazardous substance register) to employees and others who may be exposed to cyanide at the workplace;
- ensure containers containing cyanide are correctly labelled;
- ensure that the contents of any pipework or process vessels containing cyanide are adequately identified;
- assess the risk of injury or harm to people resulting from the use of cyanide;
- prevent exposure by means other than personal protective clothing or equipment as far as practicable;
- where it is not practicable to adequately reduce the risk without personal protective clothing or equipment, provide such clothing and equipment and ensure there are systems in place for its safe use and maintenance;
- provide sufficient information, training and supervision to employees to allow them to use cyanide safely; and
- plan and train for emergencies such as fire, spills and poisoning.

Very small quantities of cyanide, even as little as the size of an aspirin tablet when ingested or inhaled could be lethal. It does not matter whether you are part of a large operation using tonnes of cyanide or just using a few grams in a small workshop.

If you work in a place where cyanide is used or stored:

- prevent accidents by following the proper procedures for safe handling, storage and disposal;
- be able to recognise the early signs and symptoms of cyanide poisoning; and
- be prepared for an emergency by learning the correct first-aid treatment.

Avoid poisoning by preventing cyanide from entering the body. Entry to the body can be from:

- breathing cyanide gas or dust;
- swallowing cyanide solids or liquids; or
- absorption of cyanide solutions through the skin.

Effects may occur within seconds to minutes following inhalation and could be delayed several hours following skin absorption.

To avoid breathing in cyanide gas or dust:

- ensure cyanide is stored in a closed container;
- keep workplaces and stores dry and well ventilated;
- ensure that acid chemicals cannot accidentally come in contact with cyanide;
- do not smoke or keep cigarettes in areas where cyanide is used or stored;
- use the appropriate respirator;
- wash and dry the respirator after each use and seal it in a clean plastic bag; and
- do not store the respirator in areas where cyanide is used or stored.

Regional Offices

The respirator required will vary depending upon the concentration of dust or gas in the air. Respiratory protective equipment should be selected, used and maintained in accordance with *AS/NZS 1715 Selection, Use and Maintenance of Respiratory Protective Devices*, and should comply with *AS/NZS 1716 Respiratory Protective Devices*.

To avoid the accidental swallowing of cyanide:

- always wash before eating, drinking or smoking;
- do not eat or store food/drinks or cigarettes where cyanide is used or stored; and
- store cyanide in original labelled containers until the time of use.

To prevent cyanide from being absorbed through the skin:

- wear gloves when handling cyanide;
- wear a protective apron and face shield whenever there is the slightest chance that you will be splashed;
- do not rub your nose or eyes or pick your teeth when handling cyanide. If you have an itch - think before you scratch it! Do not bite your nails;
- do not mop up perspiration with the sleeve of your overalls or with a cloth which is kept in the areas where cyanide is used or stored;
- handle gloves, overalls and other protective equipment carefully and safely - wash immediately after use and store clean items well away from cyanide; and
- wash your hands and face whenever you leave the areas where cyanide is used or stored.

What are the health effects of cyanide poisoning?

Employees that handle, store, use or manufacture cyanides should be provided with training on being able to recognise the symptoms of cyanide poisoning and have access to qualified first aiders who are able to deal with cyanide poisoning emergencies.

Cyanide poisoning can be classed as short term (acute) or long term (chronic) and the symptoms and health effects are independent of the route of exposure.

Short Term (Acute) Poisoning

Symptoms can include headache, anxiety, dizziness, nausea and vomiting (particularly if the cyanide has been ingested), shortness of breath and a sense of suffocation, weakness with heaviness of arms and legs, falling blood pressure and cardiac arrhythmia and in cases of moderate to severe poisoning, cardiac arrest, unconsciousness and death.

Long Term Exposure (Chronic) Poisoning

Long term repeated exposure may cause headaches, shortness of breath, nose bleeds and sores in the nose, fatigue and eye irritation.

For further information on safe handling, health monitoring, first aid and medical treatment refer to the [Safe Work Australia Guide for Preventing and Responding to Cyanide Poisoning in the Workplace](#).

Storage

- Small quantities of cyanide must be stored separately in a locked poisons cupboard.
- For large quantities of cyanide dangerous goods storage regulations apply. Contact [Department of Mines and Petroleum, Resources Safety Division](#).
- The cyanide store must not contain acids.
- The store should have no sharp edges or protrusions, which might damage cyanide containers or their labels.
- Keep cyanide in securely closed, original containers.
- Check cyanide containers regularly for damage or deterioration.

Regional Offices

- Arrange cyanide stock so that the oldest is used first.
- Before taking cyanide from a drum, first remove the lid, then move away to let the accumulated gas out of the container before returning to handle the cyanide.
- A notice of action to be taken in case of suspected poisoning should be displayed in a prominent place in the store, work areas and first-aid station.
- Make sure that all employees understand the safety procedures associated with storing cyanide. Include these procedures in your safety training programme.

Remember - do not eat, drink or smoke in a cyanide store and make sure that food, drinks, cigarettes, respiratory equipment, clothing and protective equipment are not kept in any of the areas where cyanide is used or stored.

Disposal

Thoroughly rinse empty containers with large amounts of water. The rinse should be used in the cyanide process. Puncture or crush empty containers and dispose of them at approved waste disposal sites. For further information on disposal contact the [Department of Environment Regulation](#).

Fires involving cyanide

Cyanide salts or solutions are not combustible, but may generate highly toxic, flammable, corrosive and explosive hydrogen cyanide gas if in contact with water, carbon dioxide fire extinguishers, or some foam fire extinguishers if these contain acidic agents. If a fire occurs in the vicinity of cyanide:

- Evacuate the area immediately and call emergency services.
- Use air supplied breathing apparatus and full body protective clothing to rescue anyone overcome by poisonous gases or trapped by the fire.
- Fire-fighters must wear breathing apparatus and full body protective clothing.
- Use an extinguishing agent suited to the surrounding fire, however avoid incompatible extinguishing agents (water, carbon dioxide) coming into contact with cyanide.

Remember - cyanides can react with water or acids to produce the highly poisonous and flammable cyanide gas which presents a very high risk of explosion.

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Regional Offices