

Right to Know Hazardous Substance Fact Sheet

Common Name: ALDRIN

Synonyms: HHDN; Octalene

Chemical Name: 1,4,:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-

Hexachloro-1,4,4a,5,8,8a-Hexahydro-,

(1R,4S,4aS,5S,8R,8aR)-rel-

Date: January 2001 Revision: May 2010

Description and Use

Aldrin is a white to brown crystalline (sand-like) solid, or a brown liquid, with a mild chemical odor. It is an insecticide that is no longer registered for use in the United States.

Reasons for Citation

- ► Aldrin is on the Right to Know Hazardous Substance List because it is cited by OSHA, ACGIH, DOT, NIOSH, DEP, IARC, IRIS and EPA.
- ► This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

► Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

► Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Inhalation

- ▶ Remove the person from exposure.
- ▶ Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- ▶ Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222 CHEMTREC: 1-800-424-9300 NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

CAS Number: 309-00-2 RTK Substance Number: 0033

DOT Number: UN 2761 (Solid) UN 2762 (Liquid)

EMERGENCY RESPONDERS >>>> SEE LAST PAGE

Hazard Summary			
Hazard Rating	NJDOH	NFPA	
HEALTH	3	-	
FLAMMABILITY	0 (Solid) 3 (Liquid)	-	
REACTIVITY	0	-	

CARCINOGEN TERATOGEN

FLAMMABLE (LIQUID)

POISONOUS GASES ARE PRODUCED IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

- ► Aldrin can affect you when inhaled and by passing through the skin.
- ► Aldrin should be handled as a CARCINOGEN and TERATOGEN--WITH EXTREME CAUTION.
- ► Contact can irritate the skin and eyes.
- ► High exposure to **Aldrin** can cause headache, dizziness, nausea and vomiting, convulsions and even death.
- ► Aldrin may damage the liver.
- ► Aldrin does not burn, however, it is often dissolved in a liquid carrier which may be flammable or combustible.

Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is **0.25 mg/m³** averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit (REL) is **0.25 mg/m³** averaged over a 10-hour workshift.

ACGIH: The threshold limit value (TLV) is **0.05 mg/m³** (as the *inhalable fraction* and *vapor*) averaged over an 8-hour workshift.

- ▶ Aldrin may be a CARCINOGEN and TERATOGEN in humans. There may be <u>no</u> safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
- ► The above exposure limits are for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

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Determining Your Exposure

- ▶ Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- ► For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- ➤ You have a right to this information under the New Jersey Worker and Community Right to Know Act and the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- ▶ The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Aldrin**:

- ▶ Contact can irritate the skin and eves.
- ► High exposure to **Aldrin** can cause headache, dizziness, nausea and vomiting, convulsions and even death.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Aldrin** and can last for months or years:

Cancer Hazard

- ► Aldrin may be a CARCINOGEN in humans since it has been shown to cause liver cancer in animals.
- ► Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard

- Aldrin may be a TERATOGEN in humans since it is a teratogen in animals.
- ► There is limited evidence that **Aldrin** may affect male and female fertility.

There is limited evidence that Aldrin may damage the male reproductive system (including decreasing the sperm count) in animals.

Other Effects

▶ Aldrin may damage the liver.

Medical

Medical Testing

For frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:

▶ Liver function tests

If symptoms develop or overexposure is suspected, the following is recommended:

▶ EEG

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are <u>not</u> a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures

► More than light alcohol consumption can cause liver damage. Drinking alcohol may increase the liver damage caused by **Aldrin**.

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Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- ▶ Label process containers.
- ▶ Provide employees with hazard information and training.
- ▶ Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- ▶ Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- ▶ Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- ▶ Do not take contaminated clothing home.
- ▶ Get special training to wash contaminated clothing.
- ▶ Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Before entering a confined space where liquid solutions of Aldrin may be present, check to make sure that an explosive concentration does not exist.
- Use a vacuum or a wet method to reduce dust during cleanup. DO NOT DRY SWEEP.
- ► Where possible, transfer **Aldrin** from drums or other containers to process containers in an enclosed system.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

Avoid skin contact with Aldrin. Wear personal protective equipment made from material which can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.

- ► Safety equipment manufacturers recommend Silver Shield®/4H®, Viton and Barrier® as glove materials for *Hydrocarbons*, *aliphatic*, *unsaturated*, and Tychem® BR, Responder®, and TK; and Trellchem® HPS and VPS, or the equivalent, as protective clothing materials for *Hydrocarbons*, *aliphatic*, *unsaturated*.
- ▶ All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- For solid Aldrin wear eye protection with side shields or goggles.
- ► Wear indirect-vent, impact and splash resistant goggles when working with **Aldrin** in *liquid solution*.
- ▶ If additional protection is needed for the entire face, use in combination with a face shield. A face shield should not be used without another type of eye protection.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- ► For field applications check with your supervisor and your safety equipment supplier regarding the appropriate respiratory equipment.
- Where the potential exists for exposure over 0.25 mg/m³, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus or an emergency escape air cylinder.
- ▶ Exposure to **25 mg/m³** is immediately dangerous to life and health. If the possibility of exposure above **25 mg/m³** exists, use a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode equipped with an emergency escape air cylinder.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- ► Aldrin does not burn, however, it is often dissolved in a liquid carrier which may be flammable or combustible.
- ▶ Use dry chemical, CO₂, water spray, alcohol-resistant foam or other foam as extinguishing agents.
- ► POISONOUS GASES ARE PRODUCED IN FIRE, including Hydrogen Chloride.
- ▶ Use water spray to keep fire-exposed containers cool.

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Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If Aldrin is spilled or leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- ▶ Eliminate all ignition sources.
- Absorb Aldrin in *liquid solution* in vermiculite, dry sand, earth, or a similar material and place into sealed containers for disposal.
- ▶ Moisten solid Aldrin first or use a HEPA-filter vacuum for clean-up and place into sealed containers for disposal.
- ▶ Ventilate and wash area after clean-up is complete.
- ▶ DO NOT wash into sewer.
- ► Keep Aldrin in *liquid solution* out of confined spaces, such as sewers, because of the possibility of an explosion.
- ▶ It may be necessary to contain and dispose of **Aldrin** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Aldrin** you should be trained on its proper handling and storage.

- ► Aldrin is not compatible with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); ACID CATALYSTS; and PHENOL.
- ▶ Aldrin may attack METALS in the presence of WATER.
- Store in tightly closed containers in a cool, well-ventilated area away from LIGHT.
- Sources of ignition, such as smoking and open flames, are prohibited where Aldrin in liquid solution is used, handled, or stored.
- Metal containers involving the transfer of Aldrin in liquid solution should be grounded and bonded.
- ► Use only non-sparking tools and equipment, especially when opening and closing containers of **Aldrin** in *liquid solution*.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health

Right to Know

PO Box 368

Trenton, NJ 08625-0368 Phone: 609-984-2202

Fax: 609-984-7407

E-mail: rtk@doh.state.nj.us

Web address: http://www.nj.gov/health/eoh/rtkweb

The Right to Know Hazardous Substance Fact Sheets are not intended to be copied and sold for commercial purposes.

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GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Acute Exposure Guideline Levels (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A combustible substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

The **critical temperature** is the temperature above which a gas cannot be liquefied, regardless of the pressure applied.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

Emergency Response Planning Guideline (ERPG) values provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A fetus is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database on human health effects that may result from exposure to various chemicals, maintained by federal EPA.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m³ means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

Protective Action Criteria (PAC) are values established by the Department of Energy and are based on AEGLs and ERPGs. They are used for emergency planning of chemical release events.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Air*), at the same temperature and pressure.

The **vapor pressure** is a force exerted by the vapor in equilibrium with the solid or liquid phase of the same substance. The higher the vapor pressure the higher concentration of the substance in air.



Right to Know Hazardous Substance Fact Sheet



Common Name: ALDRIN

Synonyms: HHDN; Octalene

CAS No: 309-00-2

Molecular Formula: C₁₂H₈Cl₆ RTK Substance No: 0033

Description: White to brown, crystalline solid, or a brown liquid, with a mild chemical odor

HAZARD DATA		
Hazard Rating	Firefighting	Reactivity
3 - Health 0 (Solid) - Fire 3 (Liquid)- Fire 0 - Reactivity DOT#: UN 2761 (Solid) UN 2762 (Liquid) ERG Guide #: 151 (Solid) 131 (Liquid)	Aldrin does not burn, however, it is often dissolved in a liquid carrier which may be flammable or combustible. Use dry chemical, CO ₂ , water spray, alcoholresistant foam or other foam as extinguishing agents. POISONOUS GASES ARE PRODUCED IN FIRE, including <i>Hydrogen Chloride</i> . Use water spray to keep fire-exposed containers cool.	Aldrin is not compatible with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); ACID CATALYSTS; and PHENOL. Aldrin may attack METALS in the presence of WATER.
Hazard Class: 6.1 (Poison) (Solid) 3 (Flammable) (Liquid)		

SPILL/LEAKS

Isolation Distance:

Spill (solid): 25 meters (75 feet)
Spill (liquid): 50 meters (150 feet)
Fire: 800 meters (1/2 mile)

Absorb **Aldrin** in *liquid solution* in vermiculite, dry sand, earth, or a similar material and place into sealed containers for disposal.

Moisten solid Aldrin first or use a HEPA-filter vacuum for clean-up and place into sealed containers for disposal.

DO NOT wash into sewer.

Keep **Aldrin** in *liquid solution* out of confined spaces, such as sewers, because of the possibility of an explosion.

Use only non-sparking tools and equipment, especially when opening and closing containers of **Aldrin** in *liquid solution*.

Aldrin is very toxic to aquatic organisms and the environment. It bioaccumulates and has long-term effects.

EXPOSURE LIMITS

OSHA: 0.25 mg/m³, 8-hr TWA **NIOSH:** 0.25 mg/m³, 10-hr TWA **ACGIH:** 0.05 mg/m³, 8-hr TWA

IDLH: 25 mg/m³

The Protective Action Criteria values are: $PAC-1 = 0.25 \text{ mg/m}^3$ $PAC-2 = 10 \text{ mg/m}^3$

 $PAC-3 = 25 \text{ mg/m}^3$

HEALTH EFFECTS

Eyes: Irritation
Skin: Irritation

Inhalation: Headache, dizziness, nausea and vomiting,

convulsions and even death

Chronic: Cancer (liver) in animals

PHYSICAL PROPERTIES

Odor Threshold: Mild chemical odor

Vapor Pressure: 8 x 10⁻⁵ mm Hg at 68°F (20°C)

Specific Gravity: 1.6 (solid) (water = 1)
Water Solubility: Very slightly soluble

Boiling Point: Decomposes **Melting Point:** 219°F (104°C)

Molecular Weight: 365

PROTECTIVE EQUIPMENT

Gloves: Silver Shield®/4H®, Viton and Barrier® (>4-hr

breakthrough for Hydrocarbons, aliphatic, unsaturated)

Coveralls: Tychem® BR, Responder®, and TK; Trellchem® HPS

and VPS (>8-hr breakthrough for Hydrocarbons, aliphatic,

unsaturated)

Respirator: SCBA

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.

Quickly remove contaminated clothing and wash contaminated skin with large amounts of soap and water.

Begin artificial respiration if breathing has stopped and CPR if necessary.

Transfer promptly to a medical facility.