# Right to Know
# Hazardous Substance Fact Sheet

Common Name: **RONNEL**

Synonyms: Fenchlorophos; Dimethyl Trichlorophenyl Thiophosphate; Trolene; Etrolene; Nankor; Korlan; Viozene; Ectoral

Chemical Name: Phosphorothioic Acid, O, O-Dimethyl O-(2,4,5-Trichlorophenyl) Ester

Date: October 2022 Revision: June 2023

CAS Number: 299-84-3
RTK Number: 1637
DOT Number: UN 2783/UN 3018
DOT Hazard: 6.1 (toxic)

## Description and Use

**Ronnel** is a white to tan powder or waxy solid. It is an *Organophosphate* insecticide which is no longer approved for use in the United States. Commercial preparations included liquid and granular forms.

## Reason for Citation

- **Ronnel** is on the *Right to Know Hazardous Substance List* because it is regulated by OSHA and cited by ACGIH, DOT and NIOSH.

SEE GLOSSARY ON PAGE 5

## FIRST AID

**Eye Contact**

- Immediately flush eyes with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

**Skin Contact**

- Quickly remove contaminated clothing. Immediately wash area with large amounts of soap and water. Seek medical attention.
- Shampoo hair promptly if contaminated.

**Inhalation**

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Medical observation is recommended for several days following exposure as symptoms may be delayed.
- 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**

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

## Hazard Summary

| Hazard Rating | NJDOH | NFPA |
|---|---|---|
| HEALTH | 3 | - |
| FLAMMABILITY | 1 | - |
| REACTIVITY | 1 | - |
| POISONOUS GASES ARE PRODUCED IN FIRE | | |

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

- **Ronnel** can affect you when breathed in and by passing through your skin.
- Breathing **Ronnel** can irritate the eyes, nose and throat.
- Exposure can cause *Organophosphate poisoning.* Symptoms develop quickly and can be fatal. Symptoms include headache, dizziness, blurred vision, chest tightness, twitching, loss of coordination, convulsions, coma and death.
- High or repeated exposure can damage the nervous system causing numbness, pins and needles, and weakness in the hands and feet.
- Repeated exposure may cause personality changes of depression, anxiety or irritability.
- In fire, *Trichlorophenol* and *Chlorine* are produced. Consult the Right to Know Hazardous Substance Fact Sheets on these substances for more information.

## Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit is **15 mg/m$^3$** averaged over an 8-hour work shift.

NIOSH: The recommended airborne exposure limit is **10 mg/m$^3$** averaged over a 10-hour work shift.

ACGIH: The recommended airborne exposure limit is **5 mg/m$^3$** (as the *inhalable fraction*) averaged over an 8-hour work shift.

- 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.

## Determining Exposure

- Read the product Material Safety Data Sheet (MSDS) and label to determine ingredients and important safety and health information.
- Read the New Jersey Department of Health Hazardous Substance Fact Sheets on the chemicals in the product at http://nj.gov/health/workplacehealthandsafety/right-to-know/ or in your facility's Right to Know Central File or Hazard Communication Standard file.
- Public workers in New Jersey have a right to information about the chemicals with which they work under the New Jersey Worker and Community Right to Know Act and the Public Employees Occupational Safety and Health Act (PEOSHA). Private workers have the same right under the federal Occupational Safety and Health Act (OSHA).
- The New Jersey Worker and Community Right to Know Act and the PEOSH Hazard Communication Standard require most employers to label chemicals in the workplace and require public employers to provide employees with information and training on chemical hazards and controls. The federal OSHA Hazard Communication Standard requires private employers to provide similar information and training to employees.

## Health Hazard Information

Below is a summary of available information regarding health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors affect individual susceptibility.

**Acute Health Effects**

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

- Breathing **Ronnel** can irritate the eyes, nose and throat.
- Exposure to **Ronnel** can cause rapid severe *Organophosphate poisoning* with headache, sweating, nausea and vomiting, diarrhea, muscle twitching, loss of coordination, and death.

**Other Health Effects**

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

***Cancer Hazard***

- According to the information presently available to the New Jersey Department of Health, **Ronnel** has not been tested for its ability to cause cancer in animals.

***Reproductive Hazard***

- There is limited evidence that **Ronnel** is a teratogen in animals. Until further testing has been done, it should be treated as a possible teratogen in humans.

***Other Effects***

- Repeated exposure may cause personality changes of depression, anxiety or irritability.
- High or repeated exposure may damage the nerves causing weakness, pins and needles, and poor coordination in the arms and legs.

## Medical

Medical evaluations should include a detailed history of past and present symptoms and a physical exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

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

**Medical Testing**

Before employment and regularly thereafter, the following are recommended:

- Test for *Cholinesterase* levels in plasma and red blood cells. Once exposure stops, *Cholinesterase* levels will return to normal in 1-2 weeks in plasma and 1-3 months in red blood cells.
- When *Cholinesterase* levels are 25 % or more below pre-employment levels, poisoning risk increases, even if reduced levels are still in the "normal" range.
- Reassignment to work not involving *Organophosphate or Carbamate* pesticides is recommended until enzyme levels recover.

In addition, if symptoms develop, the following is recommended:

- Evaluate for brain effects such as changes in memory, concentration, sleeping, mood, headaches and fatigue.
- Consider evaluating the central, autonomic and peripheral nervous systems, with follow-up testing if results are positive or borderline.
- Consider neurobehavioral, nerve conduction and urinary enzyme testing.

**Mixed Exposures**

- There may be greater risk of experiencing effects if there is also exposure to other chemicals that affect *Cholinesterase* levels *(Organophosphates, Carbamates).*

## 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 practices are recommended:

- Label process containers.
- Train and inform employees about hazards.
- Monitor airborne chemical concentrations.
- Automatically transfer combustible and flammable liquids from storage to process containers.
- Use engineering controls at elevated levels of exposure.
- Provide eye wash fountains and emergency showers.
- Wash skin after contact with a hazardous material.
- Wash at the end of the work shift.
- Do not wear clothing once it becomes contaminated.
- Do not take contaminated clothing home.
- Special training is required 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:

- Special controls and practices for occupational exposure to pesticides are required by the Worker Protection Standard (40 CFR Part 170).
- For more information, contact the New Jersey Department of Environmental Protection Pesticide Control Program (http://www.nj.gov/dep/enforcement/pcp/index.htm).

## 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. All personal protective equipment (including suits, gloves, footwear and headgear) should be clean, available each day and put on before work.

Consult safety equipment suppliers and manufacturers for specific recommendations. The following recommendations are only guidelines and may not apply to every situation:

**Gloves and Clothing**

- Avoid skin contact.
- The recommended glove materials for *Organophosphorus compounds* are Nitrile and Neoprene.
- The recommended protective clothing materials are Tychem® BR, CSM and TK, or the equivalent.

**Eye Protection**

- When working with *liquids* wear indirect-vent, impact-resistant and splash-resistant goggles.
- When *airborne particles* or *dust* are present wear direct-vent, impact-resistant goggles.
- Wear a face shield along with impact-resistant goggles when working with corrosive, highly irritating or toxic substances.

**Respiratory Protection**

***Improper use of respirators is dangerous.*** Respirators only should be used in accordance with a written program that takes into account workplace conditions, worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134). **Only use NIOSH-approved respirators.**

- For outdoor use, check with your supervisor and your safety equipment supplier regarding the appropriate respiratory equipment.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect the chemical substance, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator.
- Consider all potential exposure sources. You may need a combination of filters, pre-filters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Where the potential exists for exposure over **5 mg/m$^3$**, use a full facepiece respirator with an organic vapor cartridge and particulate prefilters. Increased protection is obtained from full facepiece powered-air purifying respirators.
- Where the potential exists for exposure over **15 mg/m$^3$**, use a 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 operated in a pressure-demand or other positive-pressure mode.
- Exposure to **300 mg/m$^3$** is immediately dangerous to life and health. If the possibility of exposure to **300 mg/m$^3$** or greater exists, use a 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

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

- Use dry chemical, $CO_2$, water spray, or a foaming agent.
- POISONOUS GASES ARE PRODUCED IN FIRE, including *Sulfur Oxides, Dimethyl Sulfide, Trichlorophenol, Phosphorous Oxides* and *Chlorine*.

## Spills and Emergencies

Employees who are required to clean-up spills or leaks must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

It may be necessary to contain and dispose of this substance as HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

In case of accidental release:

- Evacuate personnel.
- Secure and control entrance to the area.
- If it is safe to do so, remove potential ignition sources.
- Collect *powdered* material in the most convenient and safe manner and deposit in sealed containers.
- DO NOT DRY SWEEP.
- Absorb *liquids* in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
- Do not allow this substance to enter waterways, including sewers, as it is very hazardous to aquatic life with long-lasting effects.
- Ventilate and wash area after clean-up is complete.

## Handling and Storage

Prior to working with this substance, employees should be trained on proper handling and storage.

- **Ronnel** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and ALKALINE PESTICIDES.
- Store in tightly closed containers in a cool, well-ventilated area at temperatures not exceeding 77-86 ºF (25-30 ºC) and away from inhabited buildings and food.

## Occupational Health Resources

The New Jersey Department of Health's Occupational Health Service offers information, resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations, among other services.

**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.nj.gov
Web address:
http://nj.gov/health/workplacehealthandsafety/right-to-know/

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

**GLOSSARY**

**ACGIH** is the American Conference of Governmental Industrial Hygienists. It determines Threshold Limit Values (TLVs).

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

The **CAS number** is the 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 can weaken or destroy human skin or chemical containers.

**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, a resource for responding to chemical emergencies during transportation.

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

**IARC** is the International Agency for Research on Cancer.

**IDLH** is the level of substance which is Immediately Dangerous to Life or Health.

**IRIS** is the EPA's Integrated Risk Information System.

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

**mg/m$^3$** 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 changes the genetic material of cells, and can lead to birth defects, miscarriages, or cancer.

**NJDEP** is the New Jersey Department of Environmental protection.

**NFPA** is the National Fire Protection Association. It classifies substances according to the risk of fire and explosion.

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

**NTP** is the National Toxicology Program, which tests chemicals and reviews evidence to determine carcinogenicity.

**OSHA** is the 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.

**PEL** is the permissible exposure. It is established by OSHA.

**PIH** stands for Poison Inhalation Hazard. This classification is established by the DOT.

**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 for chemical emergencies.

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

**REL** is the recommended exposure limit by NIOSH.

**STEL** is a Short-Term Exposure Limit, which should never be exceeded during the workday.

**TLV** is the Threshold Limit Value, an exposure limit for airborne concentrations.

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

**UEL** or **Upper Explosive Limit** is the concentration of a substance in air above which there is too much fuel to continue an explosion.

# RIGHT TO KNOW
## HAZARDOUS SUBSTANCE FACT SHEET

Emergency Responders Quick Reference

**Common Name:** **RONNEL**

Synonyms: Fenchlorophos; Dimethyl Trichlorophenyl Thiophosphate; Trolene; Etrolene; Nankor; Korlan; Viozene; Ectoral

CAS Number: 299-84-3

Molecular Formula: $(CH_3O)_2P(S)OC_6H_2Cl_3$

RTK Number: 1637

Description: White to tan powder or waxy solid, commercial preparations included liquid and granular forms

## HAZARD DATA

| Hazard Rating | | Firefighting | Reactivity |
|---|---|---|---|
| **Health:** | 3 | Use dry chemical, $CO_2$, water spray, or a foaming agent. | **Ronnel** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and ALKALINE PESTICIDES. |
| **Fire:** | 1 | POISONOUS GASES ARE PRODUCED IN FIRE, including *Sulfur Oxides, Dimethyl Sulfide, Trichlorophenol, Phosphorous Oxides* and *Chlorine*. | |
| **Reactivity:** | 1 | | |
| **DOT #:** | UN 2783/UN3018 | | |
| **ERG #:** | 152 | | |
| **DOT Hazard:** | 6.1 (toxic) | | |

## SPILLS/LEAKS

**Isolation Distances:**

**Liquid Spill:** 50 meters (150 feet)

**Solid Spill:** 25 meters (75 feet)

**Fire:** 800 meters (1/2 miles)

Evacuate personnel.

Secure and control entrance to the area.

If it is safe to do so, remove potential ignition sources.

Collect *powdered* material in the most convenient and safe manner and deposit in sealed containers.

DO NOT DRY SWEEP.

Absorb *liquids* in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.

Do not allow this substance to enter waterways, including sewers, as it is very hazardous to aquatic life with long-lasting effects.

Ventilate and wash area after clean-up is complete.

## PHYSICAL PROPERTIES

**Melting Point:** 41 ˚C (106 ˚F)

**Specific Gravity:** 1.49 at 25 ˚C (77 ˚ F)

**Molecular Weight:** 321.6

**Vapor Pressure:** 0.0008 mm Hg at 25 ˚C (77 ˚F)

**Water Solubility:** Insoluble

## EXPOSURE LIMITS

The following exposure limits are for **Ronnel**:

**OSHA:** 15 mg/m$^3$ – 8-hour average

**NIOSH:** 10 mg/m$^3$ – 10-hour average

**ACGIH:** 5 mg/m$^3$ (*inhalable fraction*) – 8-hour average

**IDLH:** 300 mg/m$^3$

## PROTECTIVE EQUIPMENT

**Gloves:** Nitrile and Neoprene

**Coverall:** Tychem® BR, CSM and TK, or the equivalent

**Respirator:**

**>5 mg/m$^3$** - full facepiece respirator, organic vapor cartridge, particulate prefilters

**>15 mg/m$^3$** - supplied-air respirator, full facepiece pressure-demand or other positive-pressure mode

**≥300 mg/m$^3$** - SCBA, full facepiece, pressure-demand or another positive-pressure mode

## ACUTE HEALTH EFFECTS

**Eyes:** Irritation

**Skin:** Irritation

**Inhalation:** Irritation, headache, dizziness, blurred vision, chest tightness, twitching, loss of coordination, convulsions, coma, death

## FIRST AID AND DECONTAMINATION

Immediately flush eyes with large amounts of water for at least 15 minutes.

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

Shampoo hair promptly if contaminated.

Remove the person from exposure.

Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.

Medical observation is recommended for several days following exposure as symptoms may be delayed.

Transfer promptly to a medical facility.