

Rygel Clethodim Herbicide

Classified as hazardous according to the criteria of NOHSC

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY

Supplier: Rygel Australia Pty Ltd
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Telephone: (03) 9768 2803
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Emergency telephone number: National Poisons Information Centre: Dial 13 11 26.

Product name: Rygel Clethodim Herbicide
Product Type: Group A Herbicide
Formulation type: Emulsifiable Concentrate
Chemical type: Clethodim is a cyclohexanedione oxime derivative
Product Use: For the control of certain annual and perennial grasses and broadleaf weeds in commercial and industrial areas: around agricultural buildings and rights of way as per directions for use.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS No	Conc, %	TWA (mg/m ³)	STEL (mg/m ³)
Clethodim	99129-21-2	240g/L	not set	not set
Liquid hydrocarbon	various	663g/L	not set	not set
Other non hazardous ingredients		secret to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

3. HAZARDS IDENTIFICATION

This product is classified as: Hazardous according to the criteria of NOHSC Australia.

This product does not meet the criteria of the Australian Dangerous Goods (ADG) Code. However, this is a C1 Combustible Liquid and for storage meets the definition of Dangerous Goods.

SUSDP Classification: S5

ADG Classification: None allocated. Not a Dangerous Good under the ADG Code.

UN Number: None allocated

Emergency Overview

Physical Description & colour: Amber coloured liquid.

Odour: Mild, aromatic odour.

Major Health Hazards: Effects of acute exposure to Clethodim or formulated products may include eye or skin irritation or central nervous system effects, e.g., salivation, decreased motor activity, un-coordination, unsteady gait and hyperactivity. Irritating to eyes and skin, harmful if swallowed, if aspirated, may cause lung damage.

Potential Health Effects: See section 11 for Chronic exposure studies.

Inhalation

Short term exposure: Available data indicates that this product is not harmful. However product may be mildly irritating, although unlikely to cause anything more than mild transient discomfort.

Skin Contact:

Short term exposure: Product is a skin irritant. Symptoms may include itchiness and reddening of contacted skin.

Other symptoms may also become evident, but all should disappear once exposure has ceased.

Eye Contact:

MATERIAL SAFETY DATA SHEET

Short term exposure: This product is an eye irritant. Symptoms may include stinging and reddening of eyes and watering which may become copious. Other symptoms may also become evident. If exposure is brief, symptoms should disappear once exposure has ceased. However, lengthy exposure or delayed treatment may cause permanent damage.

Ingestion:

Short term exposure: Significant oral exposure is considered to be unlikely. Because of the low viscosity of this product, it may directly enter the lungs if swallowed, or if subsequently vomited. Once in the lungs, it is very difficult to remove and can cause severe injury or death. This product is unlikely to cause any irritation problems in the short or long term.

Carcinogen Status:

NOHSC: No significant ingredient is classified as carcinogenic by NOHSC.

NTP: No significant ingredient is classified as carcinogenic by NTP.

IARC: No significant ingredient is classified as carcinogenic by IARC.

4. FIRST AID MEASURES

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Inhalation: No first aid measures normally required. However, if inhalation has occurred, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice.

Skin Contact: Wash gently and thoroughly with warm water (use non-abrasive soap if necessary) for 10-20 minutes or until product is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts) and completely decontaminate them before reuse or discard. If irritation persists, repeat flushing and seek medical attention.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the product is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately. Take special care if exposed person is wearing contact lenses.

Ingestion: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

5. FIRE-FIGHTING MEASURES

Fire and Explosion Hazards: This product is classified as a C1 combustible product. There is no risk of an explosion from this product under normal circumstances if it is involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids. Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.

Extinguishing Media: Preferred extinguishing media are carbon dioxide, dry chemical, foam, water fog.

Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade.

Flash point: 61°C (Pensky Martin closed cup)

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: C1

6. ACCIDENTAL RELEASE MEASURES

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Immediately call the Fire Brigade. Wear full protective clothing including eye/face protection. All skin areas should be covered.

Spills & Disposal Contain spill and absorb with clay, sand, soil or proprietary absorbent (such as vermiculite). Collect spilled material and waste in sealable open-top type containers for disposal.

Personal Protection For appropriate personal protective equipment (PPE), refer Section 8.

Environmental Precautions

MATERIAL SAFETY DATA SHEET

Prevent from entering drains, waterways or sewers.

7. HANDLING AND STORAGE

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

Storage: Note that this product is combustible and therefore, for Storage, meets the definition of Dangerous Goods in some states.

Protect this product from light. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight. Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Industrial Clothing: **AS2919**, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

Exposure Limits TWA (mg/m³) STEL (mg/m³)

Exposure limits have not been established by NOHSC for any of the significant ingredients in this product. The ADI for Clethodim is set at 0.01mg/kg/day. The corresponding NOEL is set at 1mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, Sept 2005.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that vapours and mists are minimised.

Eye Protection: Protective glasses or goggles should be worn when this product is being used.

Failure to protect your eyes may cause them harm. Emergency eye wash facilities are also recommended in an area close to where this product is being used.

Skin Protection: Prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

Protective Material Types: Wear protective clothing be made from the following materials: rubber, PVC.

Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts use a type G cartridge. Otherwise, not normally necessary. Eyebaths or eyewash stations and safety deluge showers should be provided near to where this product is being used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Description & colour: Amber coloured liquid.

Odour: Mild, aromatic odour.

Boiling Point: Not available.

Freezing/Melting Point: No specific data. Liquid at normal temperatures.

Volatiles: No specific data. Expected to be low at 100°C.

Vapour Pressure: 1x10⁻²mPa (clethodim)

Vapour Density: No data.

Specific Gravity: 0.945

Water Solubility: Emulsifiable.

pH: 3.6 approx (as aqueous emulsion)

Evaporation Rate: No data.

Autoignition temp: No data.

MATERIAL SAFETY DATA SHEET

10. STABILITY AND REACTIVITY

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

Conditions to Avoid: Protect this product from light. Store in the closed original container in a dry, cool, well ventilated area out of direct sunlight.

Incompatibilities: strong acids, strong bases, strong oxidising agents.

Fire Decomposition: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas. Oxides of sulfur (sulfur dioxide is a respiratory hazard) and other sulfur compounds. Most will have a foul odour.

Polymerisation: This product will not undergo polymerisation reactions.

11. TOXICOLOGICAL INFORMATION

Toxicity: An information profile for Clethodim is available at <http://extoxnet.orst.edu/pips/ghindex.html>

Acute Toxicity: Clethodim is harmful by ingestion. The reported oral LD50 is 1,630 mg/kg and 1,360 mg/kg in male and female rats, respectively. Clethodim is practically non-toxic by dermal absorption. The reported dermal LD50 is greater than 5,000 mg/kg. The technical product did not cause skin irritation in the rabbit, but formulation caused moderate skin as well as eye irritation in the rabbit. Eye irritation was reversible within 8-21 days. No data regarding skin sensitization or eye irritation were available for the technical product. Clethodim is practically non-toxic by the inhalation route. The reported rodent 4-hour inhalation LC50 for Clethodim technical is greater than 3.9 mg/L. Effects of acute exposure to Clethodim or formulated products may include eye or skin irritation or central nervous system effects, e.g., salivation, decreased motor activity, un-coordination, unsteady gait and hyperactivity. These latter effects may be in large measure due to the aromatic constituents of the formulation, as these effects commonly occur upon exposure to such compounds.

Chronic Toxicity: In a one-year feeding study of dogs, doses of 75 mg/kg/day resulted in increased relative and absolute liver weights, with anemia-like alterations in blood chemistry such as reduced hemoglobin, erythrocyte and hematocrit counts. In a two-year chronic study of rats, no compound-related effects on the structure and function of the liver were observed, and no changes in liver weights were observed at the highest dose tested, approximately 100 mg/kg/day. Reduced body weight gain was observed in another study on rats at 350 mg/kg/day, but not at 100 mg/kg/day, over an unspecified period.

Reproductive Effects: No effects on fertility, length of gestation or growth and development of offspring were observed at doses up to and including the highest dose tested, 263 mg/kg/day.

Teratogenic Effects: Data suggests that while there have been documented teratological effects in animal studies, such effects are unlikely in humans under normal conditions of exposure.

Mutagenic Effects: The available data for mutagenicity and genotoxicity yield no evidence for mutagenic or genotoxic activity.

Carcinogenic Effects: No carcinogenic effects were observed in mice administered Clethodim at doses of 24 mg/kg/day over an 18 month period. Based on the available data, it appears that Clethodim is not carcinogenic.

Organ Toxicity: The liver was the primary organ affected in chronic animal studies. Although potential effects associated with acute exposure are reported to include central nervous system effects, no available chronic data pointed to such effects.

Fate in Humans & Animals: Clethodim is readily absorbed in the gastrointestinal tract, with approximately 90% absorption of oral doses. It is rapidly metabolized and eliminated (primarily sulfoxide metabolites, ca 63%) with less than 1% recoverable unchanged.

12. ECOLOGICAL INFORMATION

This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.

Effects on Birds: Clethodim is practically non-toxic to birds. Under likely conditions of use, it is unlikely to pose a hazard to avian species.

Effects on Aquatic Organisms: Clethodim is slightly toxic to fish and aquatic invertebrate species. No effects were seen at concentrations of 5.5 mg/L in Daphnia. No significant bioaccumulation has been observed in fish. Under likely conditions of use, it is unlikely to pose a hazard to aquatic species.

Effects on Other Animals (Non-target species): Clethodim is practically non-toxic to honeybees with reported LD50s of greater than 100 µg/bee for both the technical product and formulated product.

MATERIAL SAFETY DATA SHEET

EPA has stated that "available wildlife data indicate that the proposed uses on cotton and soybeans will result in minimal hazard to non-target and endangered beneficial insect, avian and freshwater fish and mammalian species". Clethodim is selectively toxic to plants, affecting only grass species.

ENVIRONMENTAL FATE

Breakdown of Chemical in Soil and Groundwater: Clethodim is of low persistence in most soils with a reported half-life of approximately 3 days. Breakdown is mainly by aerobic processes, although photolysis may make some contribution.

Breakdown of Chemical in Surface Water: Clethodim may be highly persistent in the aquatic environment. Reported half-lives for Clethodim in the aquatic environment are 128 days in the aqueous phase and 214 days in the sediment. The reported hydrolysis half-life at pH 7-9 is approximately 300 days.

Breakdown of Chemical in Vegetation: Clethodim is rapidly degraded on the leaf surfaces by an acid-catalyzed reaction and photolysis. Remaining Clethodim will rapidly penetrate the cuticle and enter the plant.

13. DISPOSAL CONSIDERATIONS

Disposal: There are many pieces of legislation covering waste disposal and they differ in each state and territory, so each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. The Hierarchy of Controls seems to be common - the user should investigate: Reduce, Reuse, and Recycle and only if all else fails should disposal be considered. Note that properties of a product may change in use, so that the following suggestions may not always be appropriate. The following may help you in properly addressing this matter for this product. Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 <http://www.chemclear.com.au/> and for help with the disposal of empty drums, contact DrumMuster <http://www.drummuster.com.au/> where you will find contact details for your area.

14. TRANSPORT INFORMATION

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

15. REGULATORY INFORMATION

Risk Phrases: R22, R65, R36/38. Harmful if swallowed. Harmful: May cause lung damage if swallowed. Irritating to eyes and skin.

Safety Phrases: S2, S13, S46, S61, S20/21, S24/25, S36/37. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. If swallowed, contact a doctor or Poisons Information Centre immediately and show this container or label. Avoid release to the environment. Refer to special instructions/Safety Data Sheets. When using, do not eat, drink or smoke. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

AICS: All of the significant ingredients in this formulation are compliant with NICNAS regulations. The following ingredients: Clethodim, Liquid hydrocarbon, are mentioned in the SUSDP.

16. OTHER INFORMATION

All information contained in this document is as accurate as possible based on information submitted by raw material suppliers. **Rygel Australia Pty Ltd** will not be responsible for any damages that may result from reliance on the information contained herein.

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National Poisons Information Centre: Dial 13 11 26 (from anywhere in Australia).