

## SAFETY DATA SHEET

According to HSNO Hazardous Substances (Safety Data Sheets) Notice 2017

### Section 1. Identification of the material and the supplier

Product: **CARDINAL™**  
 Product Use: Organophosphate Insecticide  
 Restriction of Use: Refer to Section 15

New Zealand Supplier: **Agrisource 2000 Ltd**  
 Address: 45 Kitchener Road  
 Pukekohe, Auckland

Telephone: +64 9 237 0422  
**Emergency No: 0800 764 766 (National Poison Centre)**

Date of SDS Preparation: 4 March 2022

### Section 2. Hazards Identification

This substance is hazardous according to the EPA Hazardous Substances (Classification) Notice 2020

**EPA Approval No: HSR000224**

#### Pictograms



Signal Word: **DANGER**

GHS Classification and Category	HSNO Classification	Hazard Code	Hazard Statement
Flammable Liquids Cat. 4	3.1D	H227	Combustible liquid.
Acute oral toxicity Cat. 3	6.1C (oral)	H301	Toxic if swallowed.
Acute dermal toxicity Cat. 3	6.1C (dermal)	H311	Toxic in contact with skin.
Acute inhalation toxicity Cat. 4	6.1D (inh)	H332	Harmful if inhaled.
Aspiration hazard Cat. 1	6.1E (asp)	H304	May be fatal if swallowed and enters airways.
Eye irritation Cat. 2	6.4A	H319	Causes serious eye irritation.
Reproductive toxicity Cat. 2	6.8B	H361	Suspected of damaging fertility or the unborn child.
Specific target organ toxicity – repeated exposure Cat. 1	6.9A	H372	Causes damage to organs through prolonged or repeated exposure.
Hazardous to the aquatic environment acute Cat. 1	9.1A	H400	Very toxic to aquatic life.
Hazardous to soil organisms	9.2B	H422	Hazardous to soil organisms.
Hazardous to terrestrial vertebrates	9.3A	H431	Hazardous to terrestrial vertebrates.
Hazardous to terrestrial invertebrates	9.4A	H441	Hazardous to terrestrial invertebrates.

Prevention Code	Prevention Statement
P102	Keep out of reach of children.
P103	Read label before use.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, sparks, open flames or hot surfaces. No smoking.
P260	Do not breathe dust, fumes, gas, mist, vapours or spray.
P261	Avoid breathing dust, fumes, gas, mist, vapours or spray.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective clothing as detailed in Section 8.
P281	Use personal protective equipment as required.

Response Code	Response Statement
P101	If medical advice is needed, have product container or label at hand.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P330	Rinse mouth.
P331	Do NOT induce vomiting.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P370 + P378	In case of fire: Use water spray, foam, dry chemical, carbon dioxide or sand for extinction.

Storage Code	Storage Statement
P405	Store locked up.
P403 + P235	Store in a well-ventilated place. Keep cool.

Disposal Code	Disposal Statement
P501	Dispose of according to Local Regulations or Authorities

### Section 3. Composition / Information on Hazardous Ingredients

Ingredients	Wt % w/w	CAS NUMBER.
Chlorpyrifos	43.0 – 48.0 *	2921-88-2
Naphtha (petroleum) hydrotreated heavy	40 – 45	64742-48-9
Other ingredients	Balance	

\*to give 500 g/L chlorpyrifos

#### Section 4. First Aid Measures

Routes of Exposure:

If in Eyes	Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If on Skin	In case of skin contact, immediately flush skin with plenty of water and soap. Remove contaminated clothing. Cold water may be used. Wash clothing before reuse. Get medical attention if irritation persists.
If Swallowed	Rinse mouth. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.
If Inhaled	Wash out mouth with water. Keep patient at rest and seek <b>urgent</b> medical advice as above. <b>Transport patient to doctor or hospital quickly.</b> If advised by doctor or Poisons Centre, atropine tablets may be administered. DO NOT attempt to give anything by mouth to a semi-conscious or unconscious person. If vomiting occurs spontaneously, keep head below hips to avoid aspiration into lungs.

#### Most important symptoms and effects, both acute and delayed

Symptoms: May be fatal if swallowed and enters airways. Toxic if swallowed or in contact with skin. Harmful if inhaled. Causes serious eye irritation. Causes damage to organs through prolonged or repeated exposure. Suspected of damaging fertility or the unborn child.

**Advice to Doctor:** Antidote 1: Atropine sulphate. Antidote 2: Obidoxime chloride or Pralidoxime (PAM) Suggest serum and/or RBC cholinesterase determination. If ingested perform gastric lavage and administer activated charcoal.

#### Section 5. Fire Fighting Measures

<b>Hazard Type</b>	This product is combustible.
<b>Hazards from combustion products</b>	Carbon monoxide, carbon dioxide, hydrogen chloride, sulfur oxide, nitrogen oxides, phosphorus oxides, chlorides sulphide.
<b>Suitable Extinguishing media</b>	Water spray, foam, dry chemical, Carbon dioxide.
<b>Precautions for firefighters and special protective clothing</b>	Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke or gases.
<b>HAZCHEM CODE</b>	<b>2X</b>

#### Section 6. Accidental Release Measures

Avoid contact with skin and eyes. Do not inhale spray. Wear Full Personal Protective Equipment (**PPE**). Chemical resistant coveralls, chemical resistant gloves, chemical resistant footwear plus socks, chemical resistant headgear and chemical resistant eyewear. Respiratory protection equipment (**RPE**) appropriate to protect against respiratory exposure to this substance in mist or vapour forms. Do not eat, drink or smoke while using. Remove protective clothing and wash hands and face thoroughly before meals and after work. Wash protective clothing after work.

Do NOT allow spilled product or wash solution to enter sewers, drains, dams, creeks or any other waterways.

In the case of spillage, contain spilled material. Keep out animals and unprotected persons. Keep material out of streams and sewers. Vacuum or shovel waste into a drum. To decontaminate spill area, tools and equipment, wash with water. Dispose of drummed wastes in accordance with the requirements of Local

Authorities. Dispose of drummed wastes, including decontamination solution, in accordance with the requirements of Local Authorities detailed in Section 13.

## Section 7. Handling and Storage

### Precautions for Handling:

- Read label before use.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat, sparks, open flames or hot surfaces. No smoking.
- Do not breathe aerosols or vapours.
- Specific HSNO Controls apply. Refer to section 15.
- Qualified Handler required when mixing, loading and applying. Restricted to workplaces only.
- Recordkeeping required.
- Avoid contact with eyes and skin.
- Store work clothes and street clothes separately.
- Wash hand before rest or meal breaks and at the end of work.
- Change contaminated protective clothing.
- Keep away from food, drinks and tobacco.
- Do not eat, drink or smoke when using this product.
- Use only outdoors or in a well-ventilated area.
- Wear protective clothing as detailed in Section 8.
- Wash contaminated clothing and protective equipment before re-use.
- Use personal protective equipment as required.
- Avoid release to the environment.

### Precautions for Storage:

- Store away from incompatible materials listed in Section 10.
- Keep out of reach of children.
- Store in original container tightly closed and in a locked, dry, cool, well ventilated area, away from feed, seeds and foodstuffs.
- Store in accordance with the current version of New Zealand Standard for the Management of Agrichemicals (NZS8409).

## Section 8. Exposure Controls / Personal Protection

### WORKPLACE EXPOSURE STANDARDS (provided for guidance only)

Substance	TWA		STEL	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Chlorpyrifos [2921-88-2]	-	0.2	-	-

Workplace Exposure Standard – Time Weighted Average (WES-TWA). The time-weighted average exposure standard designed to protect the worker from the effects of long-term exposure. Workplace Exposure Standard – Short-Term Exposure Limit (WESSTEL). The 15-minute average exposure standard. Applies to any 15- Minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both the short-term and time-weighted average exposures apply. Workplace Exposure Standards and Biological Exposure Indices NOV 2020 12<sup>TH</sup> EDITION.

### Engineering Controls

Ensure ventilation is adequate, as product is used outdoors generally natural ventilation is adequate.

### Personal Protection Equipment



<b>Eyes</b>	Chemical resistant eyewear.
<b>Hands</b>	Chemical resistant gloves.
<b>Skin</b>	Chemical resistant coveralls, chemical resistant footwear plus socks, chemical resistant headgear for overhead exposures.
<b>Respiratory</b>	Not applicable.

## Section 9. Physical and Chemical Properties

<b>Appearance</b>	Liquid
<b>Colour</b>	Yellow
<b>Odour</b>	Aromatic solvent
<b>Odour Threshold</b>	Not available
<b>pH</b>	4.5 – 6.5 (1% aqueous)
<b>Boiling Point</b>	Not available
<b>Melting Point</b>	Not available
<b>Freezing Point</b>	Not available
<b>Flash Point</b>	ca 65° C
<b>Flammability</b>	Not available
<b>Upper and Lower Explosive Limits</b>	Not available
<b>Vapour Pressure</b>	Not available
<b>Vapour Density</b>	Not available
<b>Specific Gravity/ Density</b>	Approx. 1.08-1.10 (20°C) (refer to specific batch COA)
<b>Solubility</b>	Not available
<b>Octanol/water partition coefficient</b>	Not available
<b>Auto-ignition Temperature</b>	Not available
<b>Decomposition Temperature</b>	Not available
<b>Kinematic Viscosity</b>	Not available
<b>Octanol/Water Particle Coefficient</b>	Not available

## Section 10. Stability and Reactivity

<b>Stability of Substance</b>	Stable under normal ambient and anticipated storage conditions (0° - 30° C.)
<b>Possibility of hazardous reactions</b>	At high temperatures, oxides of carbon may be formed which can be toxic, flammable or even corrosive.
<b>Conditions to Avoid</b>	Extreme heat.
<b>Incompatible Materials</b>	Strong oxidizing agents, strong acids.
<b>Hazardous Decomposition Products</b>	Thermal decomposition generates: carbon monoxide, carbon dioxide, hydrogen chloride, sulfur oxide, nitrogen oxides, phosphorus oxides, chlorides, sulfides.

## Section 11. Toxicological Information

Acute toxicity:	Toxic if swallowed or in contact with skin. Harmful if inhaled.
Aspiration hazard:	Contains petroleum hydrocarbon solvent. May be fatal if swallowed and aspirated into lungs.
Respiratory irritation:	Vapours may be irritating to upper respiratory tract.
Skin corrosion/irritation:	May be slightly irritating to skin.
Serious eye damage/irritation:	Causes serious eye irritation.
Respiratory or skin sensitization:	Not classified as sensitiser.
Germ cell mutagenicity:	Not classified as mutagen.
Carcinogenicity:	Not classified as carcinogen.
Reproductive toxicity:	Chlorpyrifos may cause reproductive damage from repeated or prolonged exposure.

Specific organ toxicity:	Chlorpyrifos causes damage to organs from repeated or prolonged exposure. Affects nervous system, blood and hematopoietic system, liver and respiratory system.
Narcotic effects:	Not classified.
Toxicological information:	<u>Chlorpyrifos (active)</u> Oral, rat LD <sub>50</sub> 66 mg/kg bw (PPDB) Oral, rat LD <sub>50</sub> 96 mg/kg bw (CCID) Dermal, mouse LD <sub>50</sub> 120 mg/kg bw (CCID) Inhalation, rat LC <sub>50</sub> (4 hr), dust <5.3 mg/L (CCID)

## Section 12. Ecotoxicological Information

Very toxic to aquatic life and with long lasting effects  
Hazardous to soil organisms  
Hazardous to terrestrial vertebrates  
Hazardous to terrestrial invertebrates

<b>Persistence and degradability</b>	Chlorpyrifos : DT <sub>50</sub> (lab) @ 20°C, 386 days; DT <sub>50</sub> (field), 27.6 days
<b>Bioaccumulation</b>	Chlorpyrifos is bioaccumulative. BCF: 1374.
<b>Mobility in Soil</b>	Chlorpyrifos solubility in water, 1.05 mg/L
<b>Other adverse effects</b>	No data available

<b>Toxicity to fish:</b>	Chlorpyrifos <i>Menida peninsulae</i> (tidewater silverfish), LC <sub>50</sub> (96 h) 0.0004 mg/L <i>Oncorhynchus mykiss</i> (rainbow trout), LC <sub>50</sub> (96 h), 0.025 mg/L
<b>Toxicity to daphnia:</b>	Chlorpyrifos <i>Daphnia magna</i> , LC <sub>50</sub> (48 h) 0.00010 mg/L <i>Ceriodaphnia dubia</i> , LC <sub>50</sub> (48 h) 0.000058 mg/L
<b>Toxicity to algae:</b>	Chlorpyrifos <i>Selenastrum capricornutum</i> , EC <sub>50</sub> (72 h) 0.064 mg/L
<b>Aquatic plant:</b>	Chlorpyrifos <i>Lemna gibba</i> , EC <sub>50</sub> (7 d), biomass, 0.53 mg/L
<b>Toxicity to birds:</b>	Chlorpyrifos <i>Colinus virginianus</i> , LD <sub>50</sub> 39.2 mg/L
<b>Toxicity to bees:</b>	Chlorpyrifos is very toxic to bees. <i>Apis mellifera</i> , LD <sub>50</sub> (contact) 0.068µg/bee, LD <sub>50</sub> (oral) 0.068µg/bee
<b>Toxicity to earthworm:</b>	Chlorpyrifos <i>Eisenia foetida</i> LC <sub>50</sub> (14 d) 129 mg/kg

## Section 13. Disposal Considerations

### Disposal Method:

Ideally, the product should be used for its intended purpose. If there is a need to dispose of the product, follow the recommendations in NZS 8409.

Container disposal: Triple rinse container and add rinsate to spray tank. Dispose of cleaned container at your local AGRECOVERY container collection site. Non-contaminated packages may be recycled. Handle contaminated packages in the same way as the substance itself.



**Precautions or methods to avoid:** Avoid release to the environment.

**Section 14. Transport Information**

This product is classified as a Dangerous Good for transport in NZ; NZS 5433:2012

**Road, Rail, Sea and Air Transport**

<b>UN No</b>	3018
<b>Class - Primary</b>	6.1
<b>Subclass</b>	-
<b>Packing Group</b>	III
<b>Proper Shipping Name</b>	<b>ORGANOPHOSPHOROUS PESTICIDE, LIQUID, TOXIC (contains 50% Chlorpyrifos)</b>
<b>Marine Pollutant</b>	Yes
<b>Special Provisions</b>	If the product's individual container is below 100ml, it can be transported as a non-DG as long as the product packaging is still labelled as per DG requirements and the driver is given safety information in accordance with Chapter 3.4 of the UNRTDG.

**Section 15. Regulatory Information**

This substance is classified hazardous according to the EPA Hazardous Substances (Classification) Notice 2020

EPA Approval Code: HSR000224

<b>HSW (HS) Regulations 2017</b>	<b>Trigger Quantity</b>
Signage Trigger Quantities (Schedule 3)	100L (aquatic Acute/Chronic Cat. 1)
Emergency Response Plan (Schedule 5)	100L (aquatic Acute/Chronic Cat. 1)
Secondary Containment (Schedule 5)	100L (aquatic Acute/Chronic Cat. 1)
Tracking (Schedule 26)	Not required
Certified Handlers	Not required
Location Certificate	1000L (Acute toxicity Cat. 3)
<b>HSNO Additional Controls (Restrictions of use)</b>	
HPC4B	The substance must not be applied onto or into water.
HPC4B	The substance may be applied at a maximum rate of 1500 g chlorpyrifos / ha.
HPC4B	In addition to clause 64 of the Hazardous Property Controls Notice, a person who applies this substance by a ground-based application method that is not listed in Table 2 of Schedule 10 must have one of the qualifications listed in column 1 of the last row of Table 2



LAB : Identification as an organophosphate or carbamate substance	The label for this substance must: • clearly state that the substance is an organophosphate-containing substance. • show that notification of affected parties and neighbours, in accordance with the notification requirements for this substance, must be carried out in advance of any aerial application of this substance. • state that the substance must only be used by a person with the required qualifications, or someone under the direct supervision of a person with the required qualifications, or words to that effect. • include the relevant requirements relating to any restricted entry interval (REI) set under the HSW Regulations
Notification	(1) For aerial applications of this substance, no person may apply, or engage another person to apply, the substance unless that person has given written notice of the proposed application to any person likely to be directly affected by the application, including occupiers and owners of land, dwellings or buildings or property that is immediately abutting the application area. (2) The notice referred to in subclause (1) must— (a) be given at least 2 working days but no more than 4 weeks in advance of each application; and (b) specify the following: (i) the location of application area that the substance will be applied to; (ii) the date and approximate duration of each application; (iii) the steps to be taken by the notified parties to avoid exposure; (iv) the name of the organisation/s undertaking the application; (v) contact details for the person in charge of the application (phone, email or postal address, including a contact number for immediate contact during application).
<b>Hazardous Property Controls Notice 2017</b>	
HPC Notice Part 4 Clause 47	Equipment for class 9 substances must be appropriate
HPC Notice Part 4 Clause 48	Records of application of class 9 pesticides and plant growth regulators
HPC Notice Part 2	Certain substances restricted to workplaces only.
HPC Notice Part 3	Hazardous substances in a place other than a workplace.
HPC Notice Part 4 Subpart A	Site and storage controls for class 9 substances
HPC Notice Part 4 Subpart C	Qualifications required for application of class 9 pesticide.
<b>ACVM Act and Regulations</b>	
See <a href="http://www.foodsafety.govt.nz">www.foodsafety.govt.nz</a> for registration Conditions	<b>P9943</b>



## Glossary

Cat	Category
EC <sub>50</sub>	Median effective concentration.
EEL	Environmental Exposure Limit.
EPA	Environmental Protection Authority
HSNO	Hazardous Substances and New Organisms.
HSW	Health and Safety at Work.
LC <sub>50</sub>	Lethal concentration that will kill 50% of the test organisms inhaling or ingesting it.
LD <sub>50</sub>	Lethal dose to kill 50% of test animals/organisms.
LEL	Lower explosive level.
OSHA	American Occupational Safety and Health Administration.
TEL	Tolerable Exposure Limit.
TLV	Threshold Limit Value-an exposure limit set by responsible authority.
UEL	Upper Explosive Level
WES	Workplace Exposure Limit

## References:

1. EPA CCID (Compound Classification Information Database)
2. EPA Hazardous Substances (Safety Data Sheets) Notice 2017
3. Workplace Exposure Standards and Biological Exposure Indices Nov 2020 edition.
4. Assigning a hazardous substance to a HSNO Approval (Aug 2013).
5. Transport of Dangerous goods on land NZS 5433:2020
6. HSW (Hazardous Substances) Regulations 2017
7. Pesticide Properties DataBase (PPDB)

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