

MATERIAL SAFETY DATA SHEET

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

Product identifier: CHEMINOVA MALATHION 57%

Product use: Insecticide.

EPA Reg. No. 67760-40

Supplier's name and address:

Manufacturer's name and address:

Cheminova Inc.

Refer to supplier.

P.O. Box 110566

One Park Drive, Suite 150

Research Triangle Park, NC

27709 USA

Phone #: (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)

Emergency Telephone #: 1-866-303-6950 (Medical Emergencies)

1-800-424-9300 (24 Hr. Chemtrec Number)

MSDS Prepared by: Cheminova Inc.

MSDS Preparation date: October 25, 2011

Revision date: September 29, 2014

Revision reasons: OSHA GHS Compliance

SECTION 2 — HAZARDS IDENTIFICATION

GHS Signal Word:

Warning

Classification:

Health	Environmental	Physical
Eye irritation – Category 2B	Aquatic Toxicity – Acute 1 Aquatic Toxicity – Chronic 2	Flammable liquids – Category 4

GHS Pictogram:



Hazard Statements:

Causes eye irritation.

Combustible liquid.

Very toxic to aquatic life.

Toxic to aquatic life with long lasting effects.

Precautionary Statements:

Wash skin thoroughly after handling.

Keep away from flames and hot surfaces. No smoking.

Wear protective gloves and eye protection.

Avoid release to the environment.

Response:

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.
In case of fire: Use dry chemical, carbon dioxide, water spray or foam.
Collect spillage.

Storage:

Store in well-ventilated place.
Keep cool.

Disposal:

Dispose of contents and container according to label directions.

SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>ACGIH TLV</u> 1 mg/m ³	<u>OSHA PEL</u>
Malathion	121-75-5	57	(inhalable)	15 mg/m ³
Inert ingredients:				
Aromatic hydrocarbons	64742-94-5	35	NE	NE
Containing naphthalene	91-20-3		52 mg/m ³	50 mg/m ³
NE= None established				

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

SECTION 4 — FIRST AID MEASURES

IF SWALLOWED:	Call a poison control center or doctor. Do not induce vomiting unless told to by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.
IF INHALED:	Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
IF ON SKIN OR CLOTHING:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
IF IN EYES:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. You may also contact 1-866-303-6950 for emergency medical treatment information.

Signs and symptoms of short-term (acute) exposure:

<i>Skin contact:</i>	Causes skin irritation. Repeated exposure to cholinesterase inhibitors such as malathion may without warning, cause increased susceptibility to doses of any cholinesterase inhibitor.
<i>Eye contact:</i>	Causes moderate eye irritation.

Note to Physician: Malathion is a cholinesterase inhibitor affecting the central and peripheral nervous systems and producing cardiac and respiratory depression. Antidote: Administer atropine sulfate in large doses. TWO to FOUR mg intravenously or intramuscularly as soon as cyanosis is overcome. Repeat at 5 to 10 minute intervals until signs of atropinization appear. 2-PAM chloride is a pharmacological antidote and maybe administered as an adjunct to, but not a substitute for, atropine, which is a symptomatic and often lifesaving antidote. DO NOT GIVE MORPHINE OR TRANQUILIZERS. At first sign of pulmonary edema, the patient should be given supplemental oxygen and treated symptomatically. Continued absorption of malathion may occur and relapse may occur after initial improvement. VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS. Contains petroleum distillate. May pose an aspiration pneumonia hazard.

SECTION 5 — FIRE FIGHTING MEASURES

Flash point (Method): 149° F (65° C)

Flammable limits (% by volume): Not

applicable **Explosive properties:** Not explosive

Suitable extinguishing media: Small fires: dry chemical, carbon dioxide. Large fires: water spray or foam.

Special fire-fighting procedures/equipment: Wear positive pressure self-contained breathing apparatus with full protective clothing. Remain upwind. Avoid breathing smoke.

Unusual fire and explosion hazards: The product (malathion) will decompose rapidly when heated to temperatures above 280° F (140° C), significantly increasing the risk of explosion. Direct local heating such as electric heating or by steam must be avoided.

Hazardous decomposition products in a fire: The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as dimethyl sulfide, sulfur dioxide, carbon monoxide and phosphorus pentoxide.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal precautions: Observe all protection and safety precautions when cleaning up spills. Depending on the magnitude of the spill, this may mean wearing eye protection or face mask, coveralls, protective gloves and boots when cleaning up spills. See Section 8, Personal Protection.

Environmental precautions: Ensure spilled product does not enter drains, sewers, waterways, or confined spaces.

Spill response/Cleanup: Stop the source of the spill if safe to do so. Keep unprotected persons away from the spill area. Contain the spill to prevent any further contamination of surface, soil or water. Remove sources of ignition. Spills on the floor or other impervious surface should be contained or diked and then absorbed onto an absorptive material. Collect contaminated absorbent in suitable containers. Rinse area with soda lye and much water. Absorb wash liquid onto suitable absorbent and collect in suitable containers. Wash waters must be prevented from entering surface water drains. Large spills which soak into the ground should be dug up and transferred to suitable containers. The used containers should be properly closed and labelled. Refer to Section 13 for disposal.

Prohibited materials: None known.

Special spill response procedures: If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center (phone: 1-800-424-8802).

EPA/CERCLA Reportable quantity: **Malathion** (RQ 100 lbs.)

SECTION 7 — HANDLING AND STORAGE

Safe handling procedures: Avoid contact with skin, eyes, and clothing.

Storage recommendations: Do not store or use near heat or open flame. Product should be stored in the original container in a secure, dry place. Do not contaminate with other pesticides or fertilizers. The product should never be heated above 131° F (55° C), and should not be stored for long periods of time at a temperature in excess of 77° F (25° C).

Physical or chemical hazards: Flammable. Do not use or store near heat or open flame, including pilot lights.

Other information: Completely empty bag into application equipment. Dispose of empty bag in a sanitary landfill or by incineration as allowed by state and local authorities. Avoid inhalation of smoke if incinerated.

SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ventilation and engineering controls: If handled indoors, provide mechanical exhaust ventilation to minimize concentrations. **Protective gloves:** Wear chemical-resistant gloves made of any waterproof material, such as nitrile rubber, natural rubber, butyl rubber, or Viton.

Eye protection: Wear protective eyewear, such as chemical goggles.

Other protective equipment: Wear long-sleeved shirt and long pants, shoes and socks.

Permissible exposure levels: See Section 3.

General hygiene considerations: Avoid contact with eyes, skin or clothing. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbed materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light brown liquid

Odor: Aromatic

Odor threshold: ND

pH: ND; product is acidic.

Melting point: Below 32° F (0° C)

Freezing point: ND

Initial boiling point and boiling range: ND

Flash point: 149° F (65° C) (Pensky-Martens closed cup)

Evaporation rate: ND

Flammability: NA

Upper/lower flammability or explosive limits: NA

Vapor pressure: **Malathion:** 4.5 x 10⁻⁴ Pa @ 25° C
 1.9 x 10⁻² Pa @ 45° C

Vapor density: ND

Relative density: ND; Density: 1.067 g/mL

Solubility(ies): Solubility of **Malathion** at 20° C in:

acetone >250 g/l

methanol >250 g/l

ethyl acetate >250 g/l

1,2-dichloroethane >250 g/l

xylene >250 g/l

heptanes 57 – 67 mg/l

water 148.2 mg/l @ 25° C

Partition coefficient (n-octanol/water): **Malathion:** log K_{ow}=2.75

Auto-ignition temperature: NA

Decomposition temperature: ND

Viscosity: ND

ND: Not determined

NA: Not applicable

SECTION 10 — REACTIVITY AND STABILITY DATA

Stability and reactivity: This product is stable under the recommended storage and handling conditions described in Section 7.

Hazardous polymerization: Not known to occur.

Conditions to avoid: Keep away from heat or flame.

Materials to avoid (incompatibles): Strong alkalis and strong oxidizing compounds. The product can corrode iron, steel, tin plate and copper. Malathion is rapidly hydrolyzed at pH>7.0. The product can react with caustic (basic) materials in an acid-base chemical neutralization reaction which may be hazardous because of heat release.

Hazardous decomposition products in a fire: The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as dimethyl sulfide, sulfur dioxide, carbon monoxide and phosphorus pentoxide.

Fire and explosion precautions: The product is not classified as flammable, but has a relatively low flash point. Fire prevention measures should be taken. Keep away from sources of ignition and protect from exposure to fire and heat.

SECTION 11 — TOXICOLOGICAL INFORMATION

Routes of exposure: Skin contact, skin absorption, eye contact.

Toxicological data:

LC₅₀ , inhalation (mg/L/4 hrs) = >5.1 (4-hrs)

LD₅₀, oral, (mg/kg) = >5000

LD₅₀, dermal, (mg/kg) = >5000

Eye irritation = Moderate

Skin irritation = Mild

Skin sensitizer = May cause sensitization by skin contact

Carcinogenicity:

Malathion: IARC Group 3: The agent (mixture, or exposure circumstance) is unclassifiable as to carcinogenicity to humans.

Teratogenicity, mutagenicity, other reproductive effects: No known teratogenic, mutagenic or reproductive effects.

SECTION 12 — ECOLOGICAL INFORMATION

Environmental hazards: This product is toxic to aquatic organisms, including fish and invertebrates. This product may contaminate water through drift of spray in wind. This product has a high potential for runoff after application. Use care when applying to an area which is adjacent to any body of water, and do not apply when weather conditions favor drift from target area. Poorly drained soils and soils with shallow water tables are more prone to product runoff that contains this product. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinsate.

Ecotoxicological information: The product is toxic to aquatic organisms. The ecotoxicity measured on the active ingredient is:

Malathion:

Fish – 96-hr LC₅₀, Rainbow trout (*Oncorhynchus mykiss*) = 0.18 mg/l

37-day NOEC, Rainbow trout (*Oncorhynchus mykiss*) = 0.21 µg/l

Invertebrates – 48-Hr EC₅₀, Daphnids (*Daphnia magna*) = 0.72 µg/l

21-day NOEC, Daphnids (*Daphnia magna*) = 0.06 µg/l

Algae – 72-hr IC₅₀, Green Algae (*Selenastrum capricornutum*) = 4.06 mg/l

Birds – LD₅₀, Bobwhite quail (*Colinus virginianus*) = 359 mg/kg

5-day dietary LC₅₀, Bobwhite quail (*Colinus virginianus*) = 3,497 mg/kg

LD₅₀, Mallard duck (*Anas platyrhynchos*) = 1,485 mg/kg

Earthworms – 14-day LC₅₀, *Eisenia foetida foetida* = 613 mg/kg soil

Bees – LD₅₀, acute oral = 0.38 µg/bee

LD₅₀, topical = 0.27 µg/bee

Mobility: Under normal conditions Malathion is of medium mobility in soil, but is degraded rapidly.

Persistence and degradability: Malathion is biodegradable but does not fulfil the criteria for being readily biodegradable. It undergoes rapid degradation in the environment and in waste water treatment plants. No adverse effects are found at concentrations up to 100 mg/l in waste water treatment plants. Degradation occurs both aerobically and anaerobically, mostly biologically. Degradation half-lives vary with circumstances, but are usually one to a few days in aerobic soil and water.

Bioaccumulative potential: Malathion is not expected to bioaccumulate. It is rapidly metabolized and excreted (with half-life approximately 3 days). The measured bioconcentration factor (BCF) of Malathion is 95 (average for several fish species).

SECTION 13 — DISPOSAL CONSIDERATIONS

Handling for disposal: To avoid wastes, use all material by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program.

Methods of disposal: Do not contaminate water, food, or feed by storage or disposal. Refer to product label for specific container disposal instructions.

SECTION 14 — TRANSPORTATION INFORMATION

US DOT 49 CFR information:

For **non-bulk** shipments (<19.5 gals):

This material is not regulated for transport.

For **non-bulk** shipments (≥19.5 gals, <119 gals):

NA1993, Combustible liquid, n.o.s. (aromatic hydrocarbons), PGIII, RQ (Malathion)

For **bulk** shipments (≥119 gals) by all modes of transportation:

NA1993, Combustible liquid, n.o.s. (aromatic hydrocarbons), PGIII, RQ (Malathion), Marine Pollutant

INTERNATIONAL:

IMDG/IMO (vessel): UN3082, Environmentally hazardous substance, liquid, n.o.s. (Malathion), 9, PGIII, Marine Pollutant

IATA/ICAO (air): UN3082, Environmentally hazardous substance, liquid, n.o.s. (Malathion), 9, PGIII, Marine Pollutant

SECTION 15 — REGULATORY INFORMATION

FIFRA: This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels on non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING

Harmful if swallowed.

Causes substantial but temporary eye injury.

Avoid contact with skin, eyes and clothing.

May be dangerous for the environment.

This product is toxic to aquatic organisms.

EPA/CERCLA Reportable Quantity (RQ): Malathion - RQ 100 lbs.

SARA TITLE III:

Sec. 302, Extremely Hazardous Substance Notification: This material is not known to contain any Extremely Hazardous Substances.

Sec. 311/312, Hazard Categories: Immediate (acute) health hazard
Chronic (delayed) health hazard

Sec. 313, Toxic Chemicals Notification: Malathion (CAS #: 121-75-5) 57%

California Proposition 65: Not applicable

SECTION 16 — OTHER INFORMATION

HMIS Rating: 2 Health; 2 Flammability; 0 Reactivity

NFPA Rating: 2 Health; 2 Flammability; 0 Reactivity

0-minimal 1- slight 2-moderate 3-severe 4-extreme

Prepared by: Cheminova Inc.

Telephone #: (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)

Preparation date: September 29, 2014