

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 7/22/99
Product Code: 16651
MSDS: 006416

CHLOROPICRIN

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Chloropicrin

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Chloropicrin	CAS # 000076-06-2	96%
Trace quantities of water and HCl		4%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR) 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Hazardous. Colorless liquid with intensely irritating tear gas odor. May cause severe eye irritation with corneal injury which may result in permanent impairment of vision, even blindness. Painful irritation of the eyes at 1 ppm or less; a concentration of 15 ppm for longer than 1 minute is intolerable to humans. Single prolonged exposure may result in the material being absorbed in amounts which could cause death. LD₅₀ for skin absorption in rabbits is 62 mg/kg. Oral LD₅₀ for male rats is 250 mg/kg. Single brief (minutes) inhalation exposure to easily attainable concentration may cause serious adverse effects, even death. Toxic to fish and aquatic organisms. DOT Classification is **CHLOROPICRIN, 6.1, UN1580, I, POISON-INHALATION HAZARD, HAZARD ZONE B.**

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POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects which could occur if this material is not handled in the recommended manner.

EYE: May cause pain. May cause severe eye irritation with corneal injury which may result in permanent impairment of vision, even blindness. Vapors cause lacrimation, and painful irritation of the eyes at 1 ppm or less; a concentration of 15 ppm for longer than 1 minute is intolerable to humans because of the intense irritation produced.

SKIN: Short single exposure may cause severe skin burns. A single prolonged exposure may result in the material being absorbed in amounts which could cause death. The LD₅₀ for skin absorption in rabbits is 62 mg/kg. Vapors may irritate skin. May cause more severe response if skin is abraded (scratched or cut). Vapors may increase susceptibility to infections.

INGESTION: Single dose oral toxicity is moderate. The oral LD₅₀ for male rats is 250 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. May cause severe burns of the mouth and throat. Ingestion may cause gastrointestinal irritation or ulceration. In animals, effects have been reported on the following organ: liver.

INHALATION: A single brief (minutes) inhalation exposure to easily attainable concentrations may cause serious adverse effects, even death. Excessive exposure may cause lung injury. May cause respiratory sensitization in susceptible individuals. Excessive exposure may cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen. In humans, effects have been reported on the following organs: heart, kidney, and liver. Signs and symptoms of excessive exposure may include cyanosis, nausea, vomiting, diarrhea, abdominal cramps, and/or central nervous system effects. Initial symptoms due to low-level exposure may not seem severe but death may ensue due to delayed effects of lung injury and/or infection. DOT Classification is **CHLOROPICRIN, 6.1, UN1580, I, POISON-INHALATION HAZARD, HAZARD ZONE B.**

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Effects have been reported on the following organ: stomach.

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CANCER INFORMATION: Available data are inadequate to evaluate carcinogenicity.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

4. FIRST AID:

EYES: Immediate and continuous irrigation with flowing water for at least 30 minutes is imperative. Prompt medical consultation is essential.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician if irritation persists. Call a physician if irritation persists. Destroy and dispose of leather items which cannot be decontaminated (i.e. shoes, watchbands, belts).

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: Methemoglobinemia may aggravate any pre-existing condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias. If burn is present, treat as any thermal burn, after decontamination. May cause tissue destruction leading to stricture. If lavage is performed, suggest endotracheal and/or esophageal control. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. Persons receiving a significant exposure to this material by inhalation should be observed 24-48 hours for delayed pulmonary edema.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not combustible
METHOD USED: Not applicable

FLAMMABLE LIMITS

LFL: Not applicable
UFL: Not applicable

EXTINGUISHING MEDIA: All conventional extinguishing media are suitable.

FIRE & EXPLOSION HAZARDS: Not a combustible. Heated material decomposes violently at 233°F (112°C) especially when in contact with metals. Toxic and irritating gases will emit.

FIRE-FIGHTING EQUIPMENT: Wear self-contained breathing apparatus and protective clothing, evaluate area, cool containers with water spray from remote location.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Evacuate immediate area of spill or leak. Use a NIOSH approved air purifying respirator approved for organic vapors, self contained breathing apparatus, or an air supplied respirator. Move leaking or damaged containers outdoors or to an isolated location. Allow spilled material to evaporate into dry sand, earth or similar absorbent material, which may be disposed on site, or at an approved disposal facility. Do not permit entry into spill area or clean-up area by unprotected persons until concentration of chloropicrin is determined to be less than 0.1 ppm. Contact Dow AgroSciences at 800-992-5994 for large spills.

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7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Avoid any possible contact with liquid or vapor. Measure chloropicrin concentration with a Matheson-Kitagawa detection device using tube 172. Store upright in a cool, dry, well ventilated area under lock and key. Post as a pesticide storage area. Do not contaminate water, food, or feed by storage or disposal. Persons moving or handling containers should wear protective clothing. Open container only in a well ventilated area wearing protective clothing and respiratory protection if necessary.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):

Chloropicrin: ACGIH TLV and OSHA PEL are 0.1 ppm. ACGIH classification is A4.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Lethal concentrations may exist in areas with poor ventilation.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use a NIOSH approved positive-pressure supplied-air respirator for organic vapors.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full body suit will depend on operation. Use gloves, impervious to this material, at all times. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and destroyed.

EYE/FACE PROTECTION: Use chemical goggles. Wear a face-shield which allows use of chemical goggles, or wear a full-face respirator to protect face and eyes when there is any likelihood of splashes. Eye wash fountain should be located in immediate work area.

APPLICATORS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: 233°F (112°C)
VAPOR PRESSURE: 18.3 @ 20°C
VAPOR DENSITY: Approximately 5.7 (Air = 1.0)
SOLUBILITY IN WATER: 0.2 g/100 g
SPECIFIC GRAVITY: 1.66
APPEARANCE: Colorless liquid
ODOR: Intensely irritating tear gas odor

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Unstable under fire conditions. Avoid temperatures above 140°F (60°C)

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Organic amines, reducing agents and sulfuric acid. Incompatible with containers or equipment made of aluminum, magnesium or their alloys.

HAZARDOUS DECOMPOSITION PRODUCTS: Highly toxic phosgene and toxic nitrogen oxide.

HAZARDOUS POLYMERIZATION: Not known to occur.

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11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY: Has been shown to have mutagenic activity in bacteria. Animal mutagenicity studies were inconclusive.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: Bioconcentration potential is low (BCF <100 or Log Pow <3). Potential for mobility in soil is high (Koc between 50 and 150). Measured log octanol/water partition coefficient (Log Pow) is 2.09. Log octanol/water partition coefficient (Log Pow) is estimated using a structural fragment method to be 1.32. Soil organic carbon/water partition coefficient (Koc) is estimated to be 36.05-62. Log air/water partition coefficient (Log Kaw) is -1.15. Henry's Law Constant (H) is estimated to be 2.15E-03 atm-M3 mole.

DEGRADATION & PERSISTENCE: Tropospheric half-life is estimated to be 4.8 hours. Theoretical oxygen demand (ThOD) is calculated to be 0.10 p/p.

ECOTOXICOLOGY: Material is highly toxic to fish on an acute basis (LC₅₀ is between 0.1 and 1.0 mg/L). Acute LC₅₀ in fathead minnow (*Pimephales promelas*) is 0.3 mg/L.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Wastes are toxic. Improper disposal of excess waste is a violation of federal law. If wastes cannot be used according to the label directions, dispose of in accordance with all applicable local, state or federal requirements. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

14. TRANSPORT INFORMATION:

For DOT regulatory information, if required, consult transportation regulations, product shipping papers or contact your Dow AgroSciences representative. DOT Classification is **CHLOROPICRIN, 6.1, UN1580, I, POISON-INHALATION HAZARD, HAZARD ZONE B.**

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME CAS NUMBER CONCENTRATION

Chloropicrin	000076-06-2	96%
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SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard

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TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
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Chloropicrin	000076-06-2	NJ2 NJ3
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NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health	4
Flammability	0
Reactivity	3

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections 3, 9, 10 & 15
Reference: DR-0001-6375
Replaces MSDS Dated: 7/20/99
Document Code: D03-000-002
Replaces Document Code: D03-000-001

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.