

MATERIAL SAFETY DATA SHEET



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

CHLOROPICRIN

Effective Date: 09-Aug-12
Product Code: 16651
MSDS: 006416

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Chloropicrin

COMPANY IDENTIFICATION:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. 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. May cause severe skin burns. Classified as corrosive to skin according to DOT guidelines. Toxic to fish and aquatic organisms. DOT Classification is **CHLOROPICRIN, 6.1, UN1580, I, POISON-INHALATION HAZARD, HAZARD ZONE B.**

EMERGENCY PHONE NUMBER: 800-992-5994

3. COMPOSITION/INFORMATION ON INGREDIENTS:

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

4. FIRST AID:

EYES: Wash Immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.

SKIN: Immediate continued and thorough washing in flowing water for at least 30 minutes is imperative while removing contaminated clothing. Prompt medical consultation is essential. Wash clothing before reuse. Properly dispose of leather items such as shoes, belts, and watchbands.

INGESTION: Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth to an unconscious person.

INHALATION: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.) If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: If methemoglobin is >10-20% consider Methylene blue 1-2 mg/kg body weight as 1% solution intravenously over 5 minutes followed by 15-30 cc flush (Price D, Methemoglobinemia, Goldfrank Toxicologic Emergencies, 5th Ed., 1994). If burn is present, treat as any thermal burn, after decontamination. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

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.

MATERIAL SAFETY DATA SHEET



CHLOROPICRIN

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

Effective Date: 09-Aug-12
Product Code: 16651
MSDS: 006416

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Evacuate immediate area of spill or leak. Use an 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.

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 an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, gloves, boots, apron, or full body suit will depend on operation. Use gloves chemically resistant 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 disposed of properly.

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

MATERIAL SAFETY DATA SHEET



CHLOROPICRIN

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

Effective Date: 09-Aug-12
Product Code: 16651
MSDS: 006416

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.

11. TOXICOLOGICAL INFORMATION:

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 disproportionate to the level of irritation to eye tissues. May cause severe eye irritation with corneal injury, which may result in permanent impairment of vision even blindness. Chemical burns may occur. 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: Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage. Classified as corrosive to skin according to DOT guidelines. Vapor may cause skin irritation. May cause more severe response if skin is abraded (scratched or cut). Prolonged or widespread skin contact may result in absorption of amounts which could cause death. The LD₅₀ for skin absorption in rabbits is 62 mg/kg.

INGESTION: Moderate toxicity if swallowed. The oral LD₅₀ for male rats is 250 mg/kg. Swallowing may result in burns of the mouth and throat. Swallowing may result in gastrointestinal irritation or ulceration. In animals, effects have been reported on the following organs: liver. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

INHALATION: 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. Brief exposure (minutes) to easily attainable concentrations may cause serious adverse effects, even death. Excessive exposure may cause lung injury. 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. In humans, symptoms may include: blue lips and fingernails, nausea and/or vomiting, diarrhea, abdominal discomfort. May cause central nervous system effects. 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: gastrointestinal tract.

CANCER INFORMATION: Available data are inadequate to evaluate carcinogenicity.

TERATOLOGY (BIRTH DEFECTS): Did not cause birth defects in laboratory animals. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Did not interfere with reproduction in laboratory animal studies.

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

MATERIAL SAFETY DATA SHEET



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

Effective Date: 09-Aug-12
Product Code: 16651
MSDS: 006416

CHLOROPICRIN

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 very highly toxic to fish on an acute basis (LC₅₀ is <0.1 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

DOT Non-Bulk

Proper Shipping Name: CHLOROPICRIN

Hazard Class: 6.1 **ID Number:** UN1580

Packing Group: PG I

DOT Bulk

Proper Shipping Name: CHLOROPICRIN

Hazard Class: 6.1 **ID Number:** UN1580

Packing Group: PG I

IMDG

Proper Shipping Name: CHLOROPICRIN

Hazard Class: 6.1 **ID Number:** UN1580

Packing Group: PG I

EMS Number: F-A,S-A

Marine pollutant.: Yes

ICAO/IATA

DO NOT SHIP VIA AIR-FORBIDDEN BY IATA DUE TO INHALATION TOX. PKG. GRP. 1, OR REQUIRES PROD. DEPT., QA, & HAZ. MAT. APPROVAL: (317) 337-4419

Additional Information

POISON – INHALATION HAZARD, ZONE B

MARINE POLLUTANT

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.

MATERIAL SAFETY DATA SHEET



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

Effective Date: 09-Aug-12
Product Code: 16651
MSDS: 006416

CHLOROPICRIN

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%

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

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
Chloropicrin	000076-06-2	NJ2 NJ3

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: 14
Reference: DR-0001-6375
Replaces MSDS Dated: 30-Apr-10
Document Code: D03-000-005
Replaces Document Code: D03-000-004

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