

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: Chloropicrin

Issue Date: 12/06/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: Chloropicrin

Recommended use of the chemical and restrictions on use

Identified uses: Warning Agent

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994

info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards

No data available.

Acute Toxicity (Oral)	Category 3
Acute Toxicity (Inhalation)	Category 2
Skin Corrosion/Irritation	Category 2
Eye Damage/Irritation	Category 2
Specific Toxic Organ Toxicity (Single exposure)	Category 3

Label elements

Hazard pictograms



Signal word: DANGER!

Hazards

- H301 Toxic if swallowed.
- H330 Fatal if inhaled.
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.
- H335 May cause respiratory irritation.

Precautionary statements

Prevention

- Wash thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Use only outdoors or in a well-ventilated area.
- Wear respiratory protection.
- Wear protective gloves/wear eye protection/face protection.

Response

- IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
- Rinse mouth.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- Immediately call a POISON CENTER doctor.
- IF ON SKIN: Wash with plenty of water.
- If skin irritation occurs: Get medical advice/attention.
- Take off contaminated clothing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to remove. Continue rinsing.
- If eye irritation persists: Get medical advice/attention.

Storage

- Store in a well-ventilated place. Keep container tightly closed.
- Store locked up.

Disposal

Dispose of contents/ container to an approved waste disposal plant.

Other hazards

Persons with pre-existing skin disorders or impaired respiratory or pulmonary function may be at increased risk to the effects of this substance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a substance.

Component	CASRN	Concentration
Chloropicrin	76-06-2	>99.5%

4. FIRST AID MEASURES

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or an ambulance, and then 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.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Eye contact: Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be immediately available.

Ingestion: Call a physician and/or transport to emergency facility immediately. Do not induce vomiting unless told to do so by the poison control or doctor. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: May cause lung, liver and kidney damage. May cause allergic respiratory and skin reaction and could be fatal if inhaled. Causes eye, skin and respiratory tract irritation.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Chloropicrin can cause irritation of the mucous membrane and upper respiratory tract. Inhalation may cause anemia, weak and irregular heart, recurrent asthmatic attacks, bronchitis, pulmonary edema, and possible death. Gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion may cause colic and death. Treat appropriately. Insure medical personal are aware of the materials involved.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Unsuitable extinguishing media: No data available.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Unusual Fire and Explosion Hazards: Contact with combustible materials may cause fire and explosion. Closed containers may rupture violently when heated.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this RSSDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing dust or mist. Wash thoroughly after handling. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Chloropicrin	ACGIH	TLV-TWA	0.1 ppm
	OSHA	PEL	0.1 ppm, 0.7 mg/m ³
		TWA	0.1 ppm, 0.7 mg/m ³
	NIOSH	IDLH	2 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an approved particulate respirator. The following should be effective types of air purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state Liquid

Color	Clear to light green/light brown
Odor	Intensely irritating odor (tear gas odor)
Odor Threshold	no data available
pH	not applicable
Melting point/range	-61°C
Freezing point	no data available
Boiling point (760 mmHg)	112°C
Flash point	closed cup no data available
Evaporation Rate	no data available
Flammability (solid, gas)	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapor Pressure	23.9 mmHg (25°C)
Relative Vapor Density (air = 1)	5.7
Relative Density (water = 1)	1.657 g/cm ³ at 25°C (77°F)
Water solubility	1.6 g/L @ 25°C
Auto-ignition temperature	no data available
Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	no data available
Bulk density	no data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Conditions to avoid: Incompatible materials, excessive heat.

Incompatible materials: Amines, aniline, sodium methoxide, particularly at elevated temperatures. Do not use with PVC, aluminum, magnesium or their alloys. Mixing with water may cause formation of corrosive products over time. Contact with oxidizing and reducing agents, strong acids or bases may cause fires or explosions.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride, phosgene, carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

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. As a product the Oral LD50 has not been determined.

Acute dermal toxicity

Skin absorption is unlikely due to physical properties. Prolonged skin contact is unlikely to result in absorption of harmful amounts. As a product the Dermal LD50 has not been determined.

Acute inhalation toxicity

Pungent, sore throat, coughing, labored breathing, dizziness, nausea, vomiting, bluish skin, faintness. Serious cases may be fatal. As a product the Inhalation LC50 has not been determined.

Skin corrosion/irritation

Causes redness and chemical burns. Liquid chloropicrin has a corrosive action on the skin. Scratches or abrasions exposed to chloropicrin fumes invariably become septic.

Serious eye damage/eye irritation

May cause severe eye irritation. Corneal injury is unlikely. Powerful lachrymator, commonly referred to as tear gas.

Sensitization

No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

No data available.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Causes damage to respiratory, central nervous system through prolonged or repeated exposure. May cause damage to hematopoietic system through prolonged or repeated exposure.

Carcinogenicity

Chloropicrin - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Teratogenicity

No data available.

Reproductive toxicity

No data available.

Mutagenicity

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

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

This material is toxic to mammals, birds, and aquatic invertebrates.

Toxicity to Fish

Fish, Rainbow Trout: LC50: 0.0165 mg/l/96 Hr

Fish, Bluegill/Sunfish: LC50: 0.105 mg/l/96 Hr

Persistence and degradability

The half-life of chloropicrin in sandy loam soil was 8-24 hours and 4.5 days with carbon dioxide being the terminal breakdown product.

Bioaccumulative potential

The octanol/water partition coefficient (Log₁₀ K_{ow}) is 2.50 at 25°C indicating that chloropicrin would not be expected to bioaccumulate in mammalian cells.

Mobility in soil

Chloropicrin moves rapidly in soils within twelve inches of injection but may diffuse to a maximum depth of four feet in sandy soil. Since it is only slightly soluble in water, it will not move rapidly in aquatic environments. In an anaerobic aquatic/soil system, chloropicrin was converted to nitromethane with a half-life of 1.3 hours. In the absence of sunlight or microorganisms, chloropicrin does not undergo hydrolysis.

13. DISPOSAL CONSIDERATIONS

Disposal methods: 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.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	CHLOROPICRIN
UN number	UN 1580
Class	6.1
Packing group	I

Classification for SEA transport (IMO-IMDG):

Proper shipping name	CHLOROPICRIN
UN number	UN 1580
Class	6.1
Packing group	I
Marine pollutant	CHLOROPICRIN

Classification for AIR transport (IATA/ICAO):

Proper shipping name	CHLOROPICRIN
UN number	UN 1580
Class	6.1
Packing group	I

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

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

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Chloropicrin	76-06-2	>99.5%

Pennsylvania Worker and Community Right-To-Know Act:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

16. OTHER INFORMATION

NFPA Rating:

Health hazard: 4 Fire Hazard: 0 Reactivity Hazard: 3

SDS Status: New

Information Source and References

This SDS is prepared from information supplied by internal references within our company.

DOW AGROSCIENCES LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided 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 between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific SDSs, we are not and cannot be responsible for SDSs obtained from any source other than ourselves. If you have obtained an SDS from another source or if you are not sure that the SDS you have is current, please contact us for the most current version.