

MATERIAL SAFETY DATA SHEET



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

PATHWAY* HERBICIDE

Effective Date: 4/15/04
Product Code: 15662
MSDS: 000387

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Pathway* Herbicide

COMPANY IDENTIFICATION:

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

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Picloram: (4-amino-3,5,6-trichloropicolinic acid), triisopropanolamine salt	CAS# 006753-47-5	5.4%
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt	CAS# 018584-79-7	20.9%
Balance, Total, Including:		73.7%
Ethylene glycol	CAS# 000107-21-1	
Isopropanol	CAS# 000067-63-0	
Triisopropanolamine	CAS# 000122-20-3	
Proprietary surfactant		

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Blue-green liquid with an alcohol-like odor. May cause eye irritation or slight corneal injury. Prolonged or repeated exposure may cause skin irritation. Combustible. Keep away from heat and open flame. Hydrogen chloride may be produced during fire situations.

EMERGENCY PHONE NUMBER: 800-992-5994

4. FIRST AID:

EYES: 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.

SKIN: 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.

INGESTION: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air; if effects occur, consult a physician.

NOTE TO PHYSICIAN: If several ounces of ethylene glycol have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis and thiamine 100 mg + pyridoxine 50mg IV every 6 hours. 4-methyl pyrazole (Antizol)(R) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol, di- or triethylene glycol, ethylene glycol butyl ether, or methanol intoxication if available. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 105°F (41°C)
METHOD USED: TCC

FLAMMABLE LIMITS

LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Water fog, alcohol foam, CO₂, dry chemical.

FIRE & EXPLOSION HAZARDS: Toxic, irritating fumes may be produced if product is involved in fire. Contain water from fire fighting to prevent entry to surface or ground water.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb small spills in an inert material such as clay, Zorbball, or kitty litter. For large spills, contact Dow AgroSciences on 800-992-5994. Dike area to contain water.

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7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Harmful if swallowed, inhaled, or absorbed through skin. Causes eye irritation. Avoid contact with eyes, skin and clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Combustible. Keep product away from heat or open flame. Keep container tightly closed when not in use. Store in the original container. See product label for handling/storage precautions relative to the end use of this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

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

EXPOSURE GUIDELINE(S):

Picloram triisopropanolamine salt: None established.

ACGIH TLV and OSHA PEL are 10 mg/M³ total, 5 mg/M³ respirable.

2,4-D triisopropanolamine salt: None established. ACGIH TLV and OSHA PEL are 10 mg/M³ for the acid.

Isopropyl alcohol: ACGIH TLV is 400 ppm TWA, 500 ppm STEL, A4. OSHA PEL is 400 ppm.

Ethylene glycol: ACGIH TLV is 100 mg/M³, aerosol, Ceiling, A4. The interim IHG is 100 mg/M³ Ceiling, aerosol and vapor.

Proprietary ingredient: Dow AgroSciences Industrial Hygiene Guideline is 2 mg/M³

Proprietary ingredient: Dow AgroSciences Industrial Hygiene Guideline is 10 mg/M³.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline.

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

EYE/FACE PROTECTION: Use chemical goggles.

APPLICATORS AND ALL OTHER HANDERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: >180°F, 82°C

VAPOR PRESSURE: Approximately 32 mmHg @ 20°C

VAPOR DENSITY: 2 (alcohol)

SOLUBILITY IN WATER: Miscible

SPECIFIC GRAVITY: 1.092 @ 68/68°F

APPEARANCE: Blue-green liquid

ODOR: Alcohol-like

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Combustible. Keep away from heat and open flame. Keep container tightly closed when not in use.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Not determined.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and oxides of nitrogen may be formed if product is involved in fire.

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 moderate eye irritation, which may be slow to heal. May cause slight corneal injury.

SKIN: Prolonged or repeated contact may cause skin irritation. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rabbits is >3980 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

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INGESTION: The oral LD₅₀ for rats is >5000 mg/kg. Toxicity from ingestion may be greater in man than in animals. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Moderate toxicity if swallowed.

INHALATION: Prolonged exposure is not expected to cause adverse effects. The LC₅₀ for rats is >1.85 mg/L for four hours. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However the relevance of this to humans is unknown.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: In animals, effects have been reported on the following organs: gastrointestinal tract, kidney, liver and muscular system. Observations in animals include gastrointestinal effects and vomiting. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Observations in animals include kidney and liver effects and deposition of calcium salts in various tissues after long-term dietary intake of ethylene glycol.

CANCER INFORMATION: Picloram did not cause cancer in laboratory animals. Various animal cancer tests have shown no reliable positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative. Ethylene glycol did not cause cancer in long-term animal studies.

TERATOLOGY (BIRTH DEFECTS): 2,4-D TIPA caused birth defects in lab animals only at doses toxic to the mother. Picloram TIPA did not cause birth defects or any other fetal effects in lab animals, even at exposure levels having an adverse effect on the mother. Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies. Isopropyl alcohol at extremely high concentrations has been reported to cause birth defects and fetal toxicity in rats. At lower concentrations there were no effects on the fetus.

REPRODUCTIVE EFFECTS: Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Excessive dietary levels of 2,4-D acid have caused decreased weight and survival in offspring in a rat reproduction studies. In animal studies, picloram did not to interfere with reproduction.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): For the components tested, animal mutagenicity and in-vitro mutagenicity studies were predominantly negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:

Based largely or completely on information for picloram.
Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Potential for mobility in soil is very high (Koc between 0 and 50).
Based largely or completely on information for the remaining components.
Bioconcentration potential is low (BCF <100 or Log Pow <3).
Potential for mobility in soil is very high (Koc between 0 and 50).

DEGRADATION & PERSISTENCE:

Based largely or completely on information for picloram.
The photolysis half-life in water is 2.3-9.58 days.
Under aerobic soil conditions the half-life is 167-513 days.
Based largely or completely on information for isopropanol and ethylene glycol.
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
Based largely or completely on information for 2,4-D.
Biodegradation under aerobic static laboratory conditions is high (BOD₂₀ or BOD₂₈/ThOD is >40%).

ECOTOXICOLOGY:

Based largely or completely on information for similar material.
Material is slightly toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ between 10 and 100 mg/L in most sensitive species).

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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:

U.S. DEPARTMENT OF TRANSPORTATION INFORMATION:

Dow AgroSciences does not recommend shipment by air, however if you choose this route the following applies for shipping samples:

FLAMMABLE LIQUIDS, N.O.S. (CONTAINS ISOPROPANOL)/3/UN1993/PGIII

For Non-Bulk shipments by land:
Not regulated

For shipments by vessel:
FLAMMABLE LIQUIDS, N.O.S. (CONTAINS ISOPROPANOL)/3/UN1993/PGIII/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.

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
ISOPROPYL ALCOHOL	000067-63-0	7.8%
ETHYLENE GLYCOL	000107-21-1	15.4%

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
A fire hazard

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

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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
ISOPROPYL ALCOHOL	000067-63-0	NJ3 NJ2 NJ1 PA3 PA1
ETHYLENE GLYCOL	000107-21-1	NJ3 NJ2 PA3 PA1
2-PROPANOL, 1,1',1''-NITRILOTRIS	000122-20-3	PA1

NJ1=New Jersey Special Health Hazard Substance (present at > or = to 0.1%).

NJ2=New Jersey Environmental Hazardous Substance (present at > or = to 1.0%).

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

PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).

PA3=Pennsylvania Environmental Hazardous Substance (present at > or = 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:

Category	Rating
Health	2
Flammability	2
Reactivity	1

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA, which may require reporting of releases:

Chemical Name	CAS Number	RQ	% in Product
Ethylene Glycol	000107-21-1	5000	15.4%

16. OTHER INFORMATION:

MSDS STATUS: Revised sections: 2, 3, 11 & 13
Reference: DR-0159-4270
Replaces MSDS Dated: 1/23/03
Document Code: D03-105-005
Replaces Document Code: D03-105-004

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