

MONSANTO COMPANY
Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name

HARNESS® Herbicide

EPA Reg. No.

524-473

Chemical name

Not applicable.

Synonyms

None.

Company

MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167

Telephone: 800-332-3111, **Fax:** 314-694-5557

E-mail: TS-SAFETYDATASHEET@DOMINO.MONSANTO.COM

Emergency numbers

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).

FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

2. HAZARDS IDENTIFICATION

Emergency overview

Appearance and odour (colour/form/odour): Blue - Purple / Liquid / Mild, Sweet

RESTRICTED USE PESTICIDE due to oncogenicity.

WARNING!

CAUSES SUBSTANTIAL BUT TEMPORARY EYE AND SKIN IRRITATION

HARMFUL IF SWALLOWED

HARMFUL IF INHALED

MAY CAUSE ALLERGIC SKIN REACTION

Potential health effects

Likely routes of exposure

Skin contact, eye contact, inhalation

Eye contact, short term

May cause temporary eye irritation.

Skin contact, short term

Irritating to skin.

May cause allergic skin reaction.

Harmful in contact with skin.

Inhalation, short term

Harmful by inhalation.

Single ingestion

Harmful if swallowed.

Refer to section 11 for toxicological and section 12 for environmental information.

OSHA Status

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient

2-chloro-N-(ethoxymethyl)-N-(2-ethyl-6-methylphenyl) acetamide; {Acetochlor}

Composition

COMPONENT	CAS No.	% by weight (approximate)
Acetochlor	34256-82-1	74.8
Minor formulating ingredients		12.7
Hydrocarbon solvent (aromatic)		8.5
Furilazole (Safener)	121776-33-8	2.5
Naphthalene	91-20-3	1.5

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

Eye contact

Immediately flush with plenty of water.
Continue for at least 15 minutes.
If easy to do, remove contact lenses.
Obtain medical attention from an eye specialist.

Skin contact

Immediately wash affected skin with plenty of water.
Use soap if available.
Take off contaminated clothing, wristwatch, jewellery.
Get medical advice from a poison control center or doctor.
Wash clothes and clean shoes before re-use.

Inhalation

Remove to fresh air.
If breathing is difficult, give oxygen.
Get medical advice from a poison control center or doctor.

Ingestion

Do NOT induce vomiting.
Immediately offer water to drink.
Never give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

Flash point

> 200 °F Method: closed cup

Extinguishing media

Recommended: Water, foam, dry chemical, carbon dioxide (CO₂)

Unusual fire and explosion hazards

Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

Hazardous products of combustion

Carbon monoxide (CO), nitrogen oxides (NO_x), hydrogen chloride (HCl)

Fire fighting equipment

Self-contained breathing apparatus.

Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protection recommended in section 8.

Environmental precautions

Minimise spread.

Keep out of drains, sewers, ditches and water ways.

Methods for cleaning up

SMALL QUANTITIES:

Absorb in earth, sand or absorbent material.

LARGE QUANTITIES:

Contain spillage with sand bags or other means.

Dig up heavily contaminated soil.

Collect in containers for reclamation or disposal.

Refer to section 7 for types of containers.

Wash spill area with detergent and water.

Minimise use of water to prevent environmental contamination.

Place leaking containers in oversize leakproof drums for transport.

Refer to section 13 for disposal of spilled material.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

Handling

Avoid contact with eyes, skin and clothing.

Avoid breathing vapour or mist.

Wash hands thoroughly after handling or contact.

When using do not eat, drink or smoke.

Thoroughly clean equipment after use.

Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.

Refer to section 13 of the safety data sheet for disposal of rinse water.

Emptied containers retain vapour and product residue.

FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

Storage

Compatible materials for storage: stainless steel, Heresite[™]-lined steel, aluminium, high-density polyethylene (HDPE), polypropylene (PP), Teflon[™]

Incompatible materials for storage: unlined mild steel, polyvinyl chloride (PVC), Contact with mild steel may cause color change and reduce product's ability to emulsify with water.

Keep out of reach of children.

Keep away from food, drink and animal feed.

Keep only in the original container.

Keep container tightly closed in a cool, well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

Components	Exposure Guidelines
Acetochlor	No specific occupational exposure limit has been established.
Minor formulating ingredients	No specific occupational exposure limit has been established.
Hydrocarbon solvent (aromatic)	No specific occupational exposure limit has been established.
Furilazole (Safener)	NCEL (New Chemical Exposure Limit): 0.1 mg/m ³ (TWA)
Naphthalene	TLV (ACGIH): 10 ppm: skin, Skin notation means that skin absorption of this material may add to the overall exposure. TLV (ACGIH): 15 ppm (STEL): skin, Skin notation means that skin absorption of this material may add to the overall exposure. PEL (OSHA): 10 ppm

Engineering controls

Provide local exhaust ventilation.

Eye protection

If there is significant potential for contact:
 Wear chemical goggles.

Skin protection

Wear chemical resistant gloves.
 If there is significant potential for contact:
 Wear chemical resistant clothing/footwear.
 Applicators and other handlers must wear:
 Wear chemical resistant footwear plus socks.
 Wear coveralls over long-sleeved shirt and long pants.
 Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment.
 If no such instructions for washables, use detergent and hot water.

Respiratory protection

If airborne exposure is excessive:
 Wear respirator.
 Full facepiece/hood/helmet respirator replaces need for chemical goggles.
 Respiratory protection programs must comply with all local/regional/national regulations.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Blue - Purple
Odour:	Mild, Sweet
Form:	Liquid
Physical form changes (melting, boiling, etc.):	

Melting point:	Not applicable.
Boiling point:	No data.
Flash point:	> 200 °F Method: closed cup
Explosive properties: DATA MUST BE ENTERED	
Auto ignition temperature:	No data.
Specific gravity:	1.1071 20 °C / 25 °C
Vapour pressure:	No significant volatility.
Vapour density:	No data.
Evaporation rate:	No data.
Dynamic viscosity:	No data.
Kinematic viscosity:	No data.
Density:	1.1071 g/cm ³ @ 20 °C
Solubility:	Water: Emulsifies.
pH:	Not applicable.
Partition coefficient:	log Pow: 3.03 (acetochlor)

10. STABILITY AND REACTIVITY

Stability

Stable under normal conditions of handling and storage.

Oxidizing properties

No data.

Materials to avoid/Reactivity

Mildly corrosive to mild steel.

Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.

Self-accelerating decomposition temperature (SADT)

No data.

Hazardous polymerization

No data.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on similar products and on components are summarized below.

Similar formulation

Acute oral toxicity

Rat, female, LD₅₀: 1,849 mg/kg body weight

Slightly toxic.

FIFRA category III.

Acute dermal toxicity

Rat, LD₅₀: > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

No mortality.

Skin irritation

Rabbit, 6 animals, OECD 404 test:

Days to heal: 10
Primary Irritation Index (PII): 3.5/8.0
Moderate irritation.
FIFRA category III.

Eye irritation

Rabbit, 6 animals, OECD 405 test:

Days to heal: 7
Moderate irritation.
FIFRA category III.

Acute inhalation toxicity

Rat, female, LC50, 4 hours, aerosol: 1.4 mg/L

Slightly toxic.
FIFRA category III.

Skin sensitization

Guinea pig, 3-induction Buehler test:

Positive incidence: 80 %

Acetochlor

Mutagenicity

In vitro and in vivo mutagenicity test(s):

Equivocal response.

Repeated dose toxicity

Rat, oral, 90 days:

NOAEL toxicity: 18 mg/kg body weight/day
Target organs/systems: none
Other effects: decrease of body weight gain, decrease of food consumption

Rabbit, dermal, 21 days:

NOAEL toxicity: 400 mg/kg body weight/day
Target organs/systems: none
Other effects: increased mortality, decrease of body weight gain

Chronic effects/carcinogenicity

Rat, oral, 2 years:

NOEL tumour: 10 mg/kg body weight/day
NOAEL toxicity: 10 mg/kg body weight/day
Tumours: thyroid, nose
Target organs/systems: liver, kidneys
Other effects: decrease of body weight gain, organ weight change, blood biochemistry effects
Tumours only at or above MTD. Tumours not relevant for man based on mechanistic data.

Mouse, oral:

NOAEL toxicity: 1.1 mg/kg body weight/day
Tumours: liver, lung, haematopoietic system (histiocytic sarcoma)
Target organs/systems: kidneys, liver
Other effects: histopathologic effects, haematological effects, decrease of body weight gain
Tumours only at or above MTD. Equivocal response.

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 21 mg/kg body weight/day
NOAEL reproduction: 66 mg/kg body weight/day
Target organs/systems in parents: liver, kidneys, thyroid
Other effects in parents: decrease of body weight gain, organ weight change, histopathologic effects
Target organs/systems in pups: none
Other effects in pups: decrease of body weight gain, change in sexual maturation landmarks

Developmental toxicity/teratogenicity

Rat, oral, 6 - 18 days of gestation:

NOAEL toxicity: 200 mg/kg body weight
NOAEL development: 400 mg/kg body weight
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of body weight gain
No adverse treatment related effects in offspring.

Rabbit, oral, 7 - 19 days of gestation:

NOAEL toxicity: 100 mg/kg body weight/day
NOAEL development: 300 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of body weight gain
No adverse treatment related effects in offspring.

Acute neurotoxicity

Rat, oral, single dose, gavage:

NOAEL: 150 mg/kg body weight
Other effects: decreased activity

Repeated dose neurotoxicity

Rat, oral, 13 weeks, dietary:

NOAEL: 52 mg/kg body weight/day
Target organs/systems: none
Other effects: decrease of body weight gain, decrease of food consumption
Not neurotoxic.

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, short term, occupational:

Skin effects: sensitization in susceptible individuals

Hydrocarbon solvent (aromatic)

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, repeated, non occupational, occupational:

Skin effects: irritation

Eye contact, , non occupational, occupational:

Eye effects: irritation

Inhalation, excessive, non occupational, occupational:

Gastro-intestinal effects: nausea/vomiting

General/systemic effects: fatigue

Neurological effects: headache, confusion, incoordination, drowsiness, vertigo/dizziness, disturbance of level of consciousness, convulsions

Ingestion, short term, intentional misuse, accidental misuse:

Respiratory effects: pneumonitis (aspiration)

Gastro-intestinal effects: abdominal pain, diarrhoea

Note: May cause effects similar to those described under Inhalation.

Furilazole (Safener)

Mutagenicity

In vitro and in vivo mutagenicity test(s):

Not mutagenic on the basis of weight-of-evidence analysis.

Repeated dose toxicity

Rat, oral, 3 months:

NOAEL toxicity: 7 mg/kg body weight/day

Target organs/systems: liver

Other effects: decrease of food consumption, decrease of body weight gain, organ weight change, haematological effects, histopathologic effects

Rat, dermal, 21 days:

NOAEL toxicity: 25 mg/kg body weight/day

Target organs/systems: liver
Other effects: organ weight change

Chronic effects/carcinogenicity

Rat, oral, 2 years:

NOEL tumour: 6.03 mg/kg body weight/day
NOAEL toxicity: 0.26 mg/kg body weight/day
Tumours: liver (adenoma) (carcinoma), testes
Target organs/systems: liver, kidneys
Other effects: decrease of body weight gain, organ weight change, histopathologic effects, blood biochemistry effects

Mouse, oral, 18 months:

NOEL tumour: 5.9 mg/kg body weight/day
NOAEL toxicity: 5.9 mg/kg body weight/day
Tumours: liver (adenoma) (carcinoma), lung (adenoma) (carcinoma)
Target organs/systems: liver, lung
Other effects: increased mortality, blood biochemistry effects, organ weight change, histopathologic effects

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 10 mg/kg body weight/day
NOAEL reproduction: 99 mg/kg diet
Target organs/systems in parents: kidneys, liver
Other effects in parents: decrease of body weight gain, histopathologic effects
Target organs/systems in pups: none
Other effects in pups: none

Developmental toxicity/teratogenicity

Rat, oral, 6 - 15 days of gestation:

NOAEL toxicity: 10 mg/kg body weight
NOAEL development: 10 mg/kg body weight
Target organs/systems in mother animal: liver
Other effects in mother animal: organ weight change
Developmental effects: post-implantation loss
Effects on offspring only observed with maternal toxicity.

Rabbit, oral, 7 - 19 days of gestation:

NOAEL toxicity: 10 mg/kg body weight/day
NOAEL development: ≥ 50 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: weight loss, decrease of body weight gain, decrease of food consumption
Developmental effects: none
Other effects in foetus: none

Naphthalene

Mutagenicity

In vitro mutagenicity test(s):

Not mutagenic on the basis of weight-of-evidence analysis.

Repeated dose toxicity

Rat, oral, 13 weeks:

NOAEL toxicity: 100 mg/kg body weight/day
Target organs/systems: kidneys
Other effects: histopathologic effects, haematological effects, decrease of body weight gain

Chronic effects/carcinogenicity

Mouse, inhalation, 2 years:

NOEL tumour: 10 ppm
NOAEL toxicity: < 10 ppm
Tumours: bronchio-alveolar (adenoma)
Target organs/systems: nose, lung
Other effects: histopathologic effects

Rat, inhalation, 2 years:

NOEL tumour: < 10 ppm
NOAEL toxicity: < 10 ppm
Tumours: nose (neuroblastomas)
Target organs/systems: nose, lung
Other effects: histopathologic effects

Developmental toxicity/teratogenicity

Rabbit, oral, 9 - 19 days of gestation:

NOAEL toxicity: 120 mg/kg body weight/day
NOAEL development: 120 mg/kg body weight/day
Target organs/systems in mother animal: none
Developmental effects: none

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, repeated, non occupational, occupational:

Skin effects: irritation, sensitization

Skin contact, repeated, non occupational, occupational:

Skin effects: irritation, sensitization

Eye contact, repeated, occupational:

Eye effects: clouding of eye (opacity of cornea)

Eye contact, repeated, occupational:

Eye effects: clouding of eye (opacity of cornea)

Inhalation, excessive, occupational, non occupational:

Eye effects: eye nerve inflammation (retrobulbar and/or optic neuritis)
Skin effects: yellowing (jaundice)
Gastro-intestinal effects: nausea/vomiting
Urological/renal effects: urinary bladder inflammation (cystitis)
Haematological effects: destruction of red cells (haemolysis), methaemoglobinaemia
Autonomic system effects: increased sweating
Neurological effects: headache, confusion, incoordination, drowsiness, disturbance of level of consciousness, convulsions
Laboratory effects - urinalysis: blood in urine (haematuria)

Inhalation, excessive, occupational, non occupational:

Eye effects: eye nerve inflammation (retrobulbar and/or optic neuritis)
Skin effects: yellowing (jaundice)
Gastro-intestinal effects: nausea/vomiting
Urological/renal effects: urinary bladder inflammation (cystitis)
Haematological effects: destruction of red cells (haemolysis), methaemoglobinaemia
Autonomic system effects: increased sweating
Neurological effects: headache, confusion, incoordination, drowsiness, disturbance of level of consciousness, convulsions
Laboratory effects - urinalysis: blood in urine (haematuria)

Ingestion, short term, intentional misuse:

Gastro-intestinal effects: abdominal pain
Note: May cause effects similar to those described under Inhalation.

Ingestion, short term, intentional misuse:

Gastro-intestinal effects: abdominal pain
Note: May cause effects similar to those described under Inhalation.

12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on active ingredient(s) are summarized below.

Acetochlor

Aquatic toxicity, fish

Bluegill sunfish (*Lepomis macrochirus*):

Acute toxicity, 96 hours, static, LC50: 1.3 mg/L
Moderately toxic.

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, static, LC50: 0.36 - 1.2 mg/L
Highly toxic.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: 8.6 - 16 mg/L
Moderately toxic.

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 96 hours, static, EC50: 0.27 - 1.49 µg/L
Very highly toxic.

Avian toxicity

Bobwhite quail (*Colinus virginianus*):

Acute oral toxicity, single dose, LD50: > 31 - 1,560 mg/kg body weight

Mallard duck (*Anas platyrhynchos*):

Acute oral toxicity, single dose, LD50: > 2,000 mg/kg body weight
Practically non-toxic.

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
Practically non-toxic.

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
Practically non-toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):

Oral, 48 hours, LD50: > 100 µg/bee
Practically non-toxic.

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 200 µg/bee
Practically non-toxic.

Soil organism toxicity, invertebrates

Earthworm (*Eisenia foetida*):

Acute toxicity, 14 days, LC50: 211 - 397 mg/kg dry soil
Slightly toxic.

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):

Whole fish: BCF: 20
Rapid depuration after end of exposure.

Dissipation

Water, aerobic, 20 °C:

Half life: 12 days

Soil, aerobic, 20 °C:

Half life: 12.9 days

Koc: 204

Furilazole (Safener)

Aquatic toxicity, fish

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, static, LC50: 6.2 mg/L
Moderately toxic.

Bluegill sunfish (*Lepomis macrochirus*):

Acute toxicity, 96 hours, static, LC50: 4.6 mg/L
Moderately toxic.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: 26 mg/L
Slightly toxic.

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 72 hours, static, EbC50 (biomass): 34.8 mg/L
Slightly toxic.

Avian toxicity

Bobwhite quail (*Colinus virginianus*):

Acute oral toxicity, single dose, LD50: > 2,000 mg/kg body weight
Practically non-toxic.

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
Practically non-toxic.

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
Practically non-toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 100 µg/bee
Practically non-toxic.

Photochemical degradation

Water:

Half life: 30 days

Dissipation

Soil, aerobic, 20 °C:

Half life: 52 - 78 days
Koc: 56 - 341 L/kg

Water, aerobic, 20 °C:

Half life: 6 days

Biodegradation

Manometric respirometry test:

Degradation: 1 % within 28 days
Not readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Product

Excess product may be disposed of by agricultural use according to label instructions.
Keep out of drains, sewers, ditches and water ways.
Recycle if appropriate facilities/equipment available.
Burn in special, controlled high temperature incinerator.
Follow all local/regional/national/international regulations.

Container

See the individual container label for disposal information.
Emptied containers retain vapour and product residue.
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
Empty packaging completely.
Triple or pressure rinse empty containers.
Do NOT contaminate water when disposing of rinse waters.
Do NOT re-use containers.
Store for collection by approved waste disposal service.
Recycle if appropriate facilities/equipment available.

Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not hazardous under the applicable DOT, ICAO/IATA, IMO, TDG and Mexican regulations.

15. REGULATORY INFORMATION

IARC Classification

Category 2B Chemical(s)
Naphthalene

TSCA Inventory

Exempt

OSHA Hazardous Components

Acetochlor
Hydrocarbon solvent (aromatic)
Furilazole (Safener)
Naphthalene

SARA Title III Rules

Section 311/312 Hazard Categories
Immediate, Delayed
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Naphthalene

CERCLA Reportable quantity

RQ Component	RQ	Minimum package size containing RQ
naphthalene	100 lb	7,143 lb

Release of more than any reportable quantity to the environment in a 24 hour period requires notification to the National Response Center (800-424-8802 or 202-426-2675).

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

The state of California's Safe Drinking Water and Toxic Enforcement Act of 1986 requires the following label on this product. WARNING! This product contains chemicals known to the state of California to cause cancer.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.

Follow all local/regional/national/international regulations.

Please consult supplier if further information is needed.

In this document the British spelling was applied.

|| Significant changes versus previous edition.

	Health	Flammability	Instability	Additional Markings
NFPA	2	1	1	

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Endnotes:

- {a} EU label (manufacturer self-classification)
- {b} EU label (Annex I)
- {c} National classification

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

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