

**MONSANTO COMPANY**  
Material Safety Data Sheet  
Commercial Product

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**

**Roundup PRO® Concentrate Herbicide**

**EPA Reg. No.**

524-529

**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

**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. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Isopropylamine salt of N-(phosphonomethyl)glycine; {Isopropylamine salt of glyphosate}

**Composition**

COMPONENT	CAS No.	% by weight (approximate)
Isopropylamine salt of glyphosate	38641-94-0	50.2
Other ingredients		49.8

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

**OSHA Status**

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

## 3. HAZARDS IDENTIFICATION

**Emergency overview**

**Appearance and odour (colour/form/odour):** Amber - Brown / Liquid, (viscous) / Slight

CAUTION!

CAUSES MODERATE EYE IRRITATION

**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**

Not expected to produce significant adverse effects when recommended use instructions are followed.

#### **Inhalation, short term**

Not expected to produce significant adverse effects when recommended use instructions are followed.

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

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## **4. FIRST AID MEASURES**

#### **Eye contact**

Immediately flush with plenty of water.  
Continue for at least 15 minutes.  
If easy to do, remove contact lenses.  
If there are persistent symptoms, obtain medical advice.

#### **Skin contact**

Immediately wash affected skin with plenty of water.  
Take off contaminated clothing, wristwatch, jewellery.  
Wash clothes and clean shoes before re-use.

#### **Inhalation**

Remove to fresh air.

#### **Ingestion**

Immediately offer water to drink.  
Never give anything by mouth to an unconscious person.  
Do NOT induce vomiting unless directed by medical personnel.  
If symptoms occur, get medical attention.

#### **Advice to doctors**

This product is not an inhibitor of cholinesterase.

#### **Antidote**

Treatment with atropine and oximes is not indicated.

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## **5. FIRE-FIGHTING MEASURES**

#### **Flash point**

None.

#### **Extinguishing media**

Recommended: Water, foam, dry chemical, carbon dioxide (CO<sub>2</sub>)

#### **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<sub>x</sub>), phosphorus oxides (P<sub>x</sub>O<sub>y</sub>)

#### **Fire fighting equipment**

Self-contained breathing apparatus.  
Equipment should be thoroughly decontaminated after use.

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## **6. ACCIDENTAL RELEASE MEASURES**

#### **Personal precautions**

Use personal protection recommended in section 8.

### Environmental precautions

#### SMALL QUANTITIES:

Low environmental hazard.

#### LARGE QUANTITIES:

Minimise spread.

Contain spillage with sand bags or other means.

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

Notify authorities.

### Methods for cleaning up

Absorb in earth, sand or absorbent material.

Dig up heavily contaminated soil.

Collect in containers for disposal.

Refer to section 7 for types of containers.

Flush residues with small quantities of water.

Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

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## 7. HANDLING AND STORAGE

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

### Storage

Compatible materials for storage: stainless steel, aluminium, fibreglass, plastic

Incompatible materials for storage: unlined mild steel, galvanised steel, see section 10.

Keep out of reach of children.

Keep away from food, drink and animal feed.

Keep only in the original container.

Shelf life currently under test.

Recommended maximum shelf life: 2 years.

Follow all local/regional/national/international regulations.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Airborne exposure limits

Components	Exposure Guidelines
Isopropylamine salt of glyphosate	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

### Engineering controls

No special requirement when used as recommended.

### Eye protection

If there is significant potential for contact:

Wear chemical goggles.

Applicators and other handlers must wear eye protection.

### Skin protection

If repeated or prolonged contact:

Wear chemical resistant gloves.

### Respiratory protection

No special requirement when used as recommended.

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

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## 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:	Amber - Brown
Form:	Liquid, (viscous)
Odour:	Slight
Flash point:	None.
Specific gravity:	1.199
pH:	4.8

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## 10. STABILITY AND REACTIVITY

### Stability

Stable under normal conditions of handling and storage.

### Hazardous decomposition

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

### Materials to avoid/Reactivity

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

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## 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, LD50:** > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

#### Acute dermal toxicity

**Rat, LD50:** > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

#### Skin irritation

**Rabbit, 6 animals, OECD 404 test:**

Days to heal: 10

Primary Irritation Index (PII): 1.7/8.0

Slight irritation.

FIFRA category IV.

#### Eye irritation

**Rabbit, 6 animals, OECD 405 test:**

Days to heal: 7

Moderate irritation.

FIFRA category III.

**Acute inhalation toxicity**

**Rat, LC50, 4 hours, aerosol:**

Practically non-toxic.

FIFRA category IV.

No 4-hr LC50 at the maximum achievable concentration.

**Skin sensitization**

**Guinea pig, Buehler test:**

Positive incidence: 0 %

Negative.

No skin sensitization

**N-(phosphonomethyl)glycine; {glyphosate}**

**Mutagenicity**

**In vitro and in vivo mutagenicity test(s):**

Not mutagenic.

**Repeated dose toxicity**

**Rabbit, dermal, 21 days:**

NOAEL toxicity: > 5,000 mg/kg body weight/day

Target organs/systems: none

Other effects: none

**Rat, oral, 3 months:**

NOAEL toxicity: > 20,000 mg/kg diet

Target organs/systems: none

Other effects: none

**Chronic effects/carcinogenicity**

**Mouse, oral, 24 months:**

NOEL tumour: > 30,000 mg/kg diet

NOAEL toxicity: ~ 5,000 mg/kg diet

Tumours: none

Target organs/systems: liver

Other effects: decrease of body weight gain, histopathologic effects

**Rat, oral, 24 months:**

NOEL tumour: > 20,000 mg/kg diet

NOAEL toxicity: ~ 8,000 mg/kg diet

Tumours: none

Target organs/systems: eyes

Other effects: decrease of body weight gain, histopathologic effects

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations:**

NOAEL toxicity: 10,000 mg/kg diet

NOAEL reproduction: > 30,000 mg/kg diet

Target organs/systems in parents: none

Other effects in parents: decrease of body weight gain

Target organs/systems in pups: none

Other effects in pups: decrease of body weight gain

Effects on offspring only observed with maternal toxicity.

**Developmental toxicity/teratogenicity**

**Rat, oral, 6 - 19 days of gestation:**

NOAEL toxicity: 1,000 mg/kg body weight

NOAEL development: 1,000 mg/kg body weight

Other effects in mother animal: decrease of body weight gain, decrease of survival

Developmental effects: weight loss, post-implantation loss, delayed ossification

Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 6 - 27 days of gestation:**

NOAEL toxicity: 175 mg/kg body weight

NOAEL development: 175 mg/kg body weight  
Target organs/systems in mother animal: none  
Other effects in mother animal: decrease of survival  
Developmental effects: none

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## 12. ECOLOGICAL INFORMATION

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

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

### Similar formulation

#### Aquatic toxicity, fish

##### **Rainbow trout (*Oncorhynchus mykiss*):**

Acute toxicity, 96 hours, static, LC50: 5.4 mg/L  
Moderately toxic.

##### **Bluegill sunfish (*Lepomis macrochirus*):**

Acute toxicity, 96 hours, static, LC50: 7.3 mg/L  
Moderately toxic.

#### Aquatic toxicity, invertebrates

##### **Water flea (*Daphnia magna*):**

Acute toxicity, 48 hours, static, EC50: 11 mg/L  
Slightly toxic.

#### Avian toxicity

##### **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/contact, 48 hours, LD50: > 100 µg/bee  
Practically non-toxic.

#### Soil organism toxicity, invertebrates

##### **Earthworm (*Eisenia foetida*):**

Acute toxicity, 14 days, LC50: > 1,250 mg/kg soil  
Practically non-toxic.

### Isopropylamine salt of glyphosate (62%)

#### Aquatic toxicity, algae/aquatic plants

##### **Green algae (*Scenedesmus subspicatus*):**

Acute toxicity, 72 hours, static, EbC50 (biomass): 72.9 mg/L  
Slightly toxic.

### N-(phosphonomethyl)glycine: {glyphosate}

#### Bioaccumulation

##### **Bluegill sunfish (*Lepomis macrochirus*):**

Whole fish: BCF: < 1  
No significant bioaccumulation is expected.

#### Dissipation

##### **Soil, field:**

Half life: 2 - 174 days

Koc: 884 - 60,000 L/kg  
Adsorbs strongly to soil.

**Water, aerobic:**

Half life: < 7 days

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### 13. DISPOSAL CONSIDERATIONS

#### Product

Recycle if appropriate facilities/equipment available.  
Burn in special, controlled high temperature incinerator.  
Keep out of drains, sewers, ditches and water ways.  
Follow all local/regional/national/international regulations.

#### Container

See the individual container label for disposal information.  
Triple or pressure rinse empty containers.  
Pour rinse water into spray tank.  
Store for collection by approved waste disposal service.  
Recycle if appropriate facilities/equipment available.  
Emptied containers retain vapour and product residue.  
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.  
Follow all local/regional/national/international regulations.

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### 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.

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### 15. REGULATORY INFORMATION

#### TSCA Inventory

All components are on the US EPA's TSCA Inventory

#### OSHA Hazardous Components

Surfactant(s)

#### SARA Title III Rules

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

#### CERCLA Reportable quantity

Not applicable.

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### 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.

	Health	Flammability	Instability	Additional Markings
NFPA	1	1	1	

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

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)

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