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

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS No.</th>
<th>% by weight (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropylamine salt of glyphosate</td>
<td>38641-94-0</td>
<td>50.2</td>
</tr>
<tr>
<td>Other ingredients</td>
<td></td>
<td>49.8</td>
</tr>
</tbody>
</table>

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.

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.

5. FIRE-FIGHTING MEASURES

Flash point
None.

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 (NOx), phosphorus oxides (PxOy)

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
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.

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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropylamine salt of glyphosate</td>
<td>No specific occupational exposure limit has been established.</td>
</tr>
<tr>
<td>Other ingredients</td>
<td>No specific occupational exposure limit has been established.</td>
</tr>
</tbody>
</table>

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.

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.

<table>
<thead>
<tr>
<th>Colour/colour range:</th>
<th>Amber - Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form:</td>
<td>Liquid, (viscous)</td>
</tr>
<tr>
<td>Odour:</td>
<td>Slight</td>
</tr>
<tr>
<td>Flash point:</td>
<td>None.</td>
</tr>
<tr>
<td>Specific gravity:</td>
<td>1.199</td>
</tr>
<tr>
<td>pH:</td>
<td>4.8</td>
</tr>
</tbody>
</table>

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.

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: $> 5,000 \text{ mg/kg body weight/day}$
- Target organs/systems: none
- Other effects: none

**Rat, oral, 3 months:**
- NOAEL toxicity: $> 20,000 \text{ mg/kg diet}$
- Target organs/systems: none
- Other effects: none

**Chronic effects/carcinogenicity**

**Mouse, oral, 24 months:**
- NOEL tumour: $> 30,000 \text{ mg/kg diet}$
- NOAEL toxicity: $> 5,000 \text{ mg/kg diet}$
- Tumours: none
- Target organs/systems: liver
- Other effects: decrease of body weight gain, histopathologic effects

**Rat, oral, 24 months:**
- NOEL tumour: $> 20,000 \text{ mg/kg diet}$
- NOAEL toxicity: $> 8,000 \text{ mg/kg diet}$
- 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: $10,000 \text{ mg/kg diet}$
- NOAEL reproduction: $> 30,000 \text{ mg/kg diet}$
- 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: $1,000 \text{ mg/kg body weight}$
- NOAEL development: $1,000 \text{ mg/kg body weight}$
- 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: $175 \text{ mg/kg body weight}$
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

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 fetida):
  - 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

### 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.
- Empty containers retain vapour and product residue.
- Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
- Follow all local/regional/national/international regulations.

### 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

**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.

### 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.
<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Additional Markings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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), LDL0 (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.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.