1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Roundup PowerMAX[TM] Herbicide

EPA Reg. No.
524-549

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): Amber - Brown / Liquid / Odourless

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.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient
Potassium salt of N-(phosphonomethyl)glycine; {Potassium salt of glyphosate}

Composition
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**
If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing.

**Skin contact**
Take off contaminated clothing, wristwatch, jewellery. Wash affected skin with plenty of water. Continue for at least 15 minutes.

**Inhalation**
If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

**Ingestion**
Immediately offer water to drink. 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**
Does not flash.

**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), phosphorus oxides (PxOy), nitrogen oxides (NOx)

**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.
- Contain spillage with sand bags or other means.
- Keep out of drains, sewers, ditches and water ways.

**Methods for cleaning up**
- **SMALL QUANTITIES:**
  - Flush spill area with water.
- **LARGE QUANTITIES:**
  - 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.
Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

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**7. HANDLING AND STORAGE**

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

**Handling**
- Avoid contact with eyes, skin and clothing.
- When using do not eat, drink or smoke.
- Wash hands thoroughly after handling or contact.
- Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
- Thoroughly clean equipment after use.
- Refer to section 13 of the safety data sheet for disposal of rinse water.
- Wash contaminated clothing before re-use.
- Emptied containers retain vapour and product residue.
- FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

**Storage**
- Compatible materials for storage: stainless steel, fibreglass, plastic, glass lining
- Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
- Keep out of reach of children.
- Keep away from food, drink and animal feed.
- Keep only in the original container.

---

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Airborne exposure limits**

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium 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.

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

**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>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colour/colour range</strong></td>
<td>Amber - Brown</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Odourless</td>
</tr>
<tr>
<td><strong>Form</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Boiling point</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Does not flash</td>
</tr>
<tr>
<td><strong>Explosive properties</strong></td>
<td>No data</td>
</tr>
<tr>
<td><strong>Auto ignition temperature</strong></td>
<td>No data</td>
</tr>
<tr>
<td><strong>Specific gravity</strong></td>
<td>1.356</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>No data</td>
</tr>
<tr>
<td><strong>Dynamic viscosity</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Kinematic viscosity</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Water: Completely miscible</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Partition coefficient</strong></td>
<td>log Pow: -3.2 @ 25 °C (glyphosate)</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

**Stability**
Stable under normal conditions of handling and storage.

**Oxidizing properties**
No data.

**Materials to avoid/Reactivity**
Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.
Hazardous decomposition
Thermal decomposition: Hazardous products of combustion: see section 5.

Self-accelerating decomposition temperature (SADT)
No data.

11. TOXICOLOGICAL INFORMATION

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

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

**Skin irritation**
- **Rabbit, 3 animals, OECD 404 test:**
  - Days to heal: 7
  - Primary Irritation Index (PII): 1.9/8.0
  - Slight irritation.
  - FIFRA category IV.

**Eye irritation**
- **Rabbit, 3 animals, OECD 405 test:**
  - Days to heal: 10
  - Moderate irritation.
  - FIFRA category III.

**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.

**Acute inhalation toxicity**
- **Rat, LC50, 4 hours, aerosol:**
  - Practically non-toxic.
  - FIFRA category IV.
  - No 4-hr LC50 at the maximum tested concentration. For purposes of the inhalation test, product was artificially aerosolized. Since this material will not become aerosolized to a hazardous concentration during transport, it is classified as non-hazardous under the transportation regulations in accordance with 2.6.2.2.4.7(b) and (c) of the UN Recommendations on the Transport of Dangerous Goods.

**Skin sensitization**
- **Guinea pig, 3-induction Buehler test:**
  - Positive incidence: 0 %

**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:
NOAEL toxicity: ~ 5,000 mg/kg diet
Target organs/systems: liver
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 30,000 mg/kg diet
Tumours: none

Rat, oral, 24 months:
NOAEL toxicity: ~ 8,000 mg/kg diet
Target organs/systems: eyes
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 20,000 mg/kg diet
Tumours: none

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

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
Bluegill sunfish (Lepomis macrochirus):
Acute toxicity, 96 hours, static, LC50: 5.2 mg/L
Moderately toxic.

Common carp (Cyprinus carpio):
Acute toxicity, 96 hours, static, LC50: 4.0 mg/L
Moderately toxic.

Aquatic toxicity, invertebrates
Water flea (Daphnia magna):
  Acute toxicity, 48 hours, static, EC50: 8.0 mg/L
  Moderately toxic.

Similar formulation

Aquatic toxicity, algae/aquatic plants
  Green algae (Selenastrum capricornutum):
    Acute toxicity, 72 hours, static, EC50: 0.46 mg/L
    Highly toxic.

Arthropod toxicity
  Honey bee (Apis mellifera):
    Oral, 48 hours, LD50: > 281 µg/bee
    Practically non-toxic.
  Honey bee (Apis mellifera):
    Contact, 48 hours, LD50: > 273 µg/bee
    Practically non-toxic.

Soil organism toxicity, invertebrates
  Earthworm (Eisenia fetida):
    Acute toxicity, 14 days, LC50: > 10,000 mg/kg dry soil
    Practically non-toxic.

Soil organism toxicity, microorganisms
  Nitrogen and carbon transformation test:
    29.5 kg/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

N-(phosphonomethyl)glycine; {glyphosate}

Avian toxicity
  Bobwhite quail (Colinus virginianus):
    Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
    No more than slightly toxic.
  Mallard duck (Anas platyrhynchos):
    Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
    No more than slightly toxic.
  Bobwhite quail (Colinus virginianus):
    Acute oral toxicity, single dose, LD50: > 3,851 mg/kg body weight
    Practically non-toxic.

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
  Keep out of drains, sewers, ditches and water ways.
  Recycle if appropriate facilities/equipment available.
  Burn in proper 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.
Ensure packaging cannot be reused.
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.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

15. REGULATORY INFORMATION

TSCA Inventory
Exempt

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.
Significant changes versus previous edition.

<table>
<thead>
<tr>
<th>NFPA</th>
<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>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), LDLo (Lower limit of lethal dosage), LEL (Lower
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