

<p style="text-align: center;"><b>MONSANTO Europe S.A./N.V.</b> Safety Data Sheet Commercial Product</p>
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## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1. Product identifier

#### Roundup® Flex

- 1.1.1. **Chemical name**  
Not applicable for a mixture.
- 1.1.2. **Synonyms**  
None.
- 1.1.3. **CLP Annex VI Index No.**  
Not applicable.
- 1.1.4. **C&L ID No.**  
Not available.
- 1.1.5. **EC No.**  
Not applicable for a mixture.
- 1.1.6. **REACH Reg. No.**  
Not applicable for a mixture.
- 1.1.7. **CAS No.**  
Not applicable for a mixture.

### 1.2. Product use

Herbicide

### 1.3. Company/(Sales office)

MONSANTO Europe S.A./N.V.  
Haven 627, Scheldelaan 460, B-2040  
Antwerp, Belgium  
**Telephone:** +32 (0)3 568 51 11  
**Fax:** +32 (0)3 568 50 90  
**E-mail:**  
safety.datasheet@monsanto.com

### 1.4. Emergency numbers

**Telephone:** Belgium +32 (0)3 568 51 23

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## 2. HAZARDS IDENTIFICATION

### 2.1. Classification

#### 2.1.1. Classification according to Regulation (EC) No. 1272/2008 [CLP] (manufacturer self-classification)

Not classified as dangerous.

#### 2.1.2. National classification - Ireland

Not classified as dangerous.

**EU label (manufacturer self-classification)** - Classification/Labeling following the EU Dangerous Preparations' Directive 1999/45/EC.

Not classified as dangerous.

S29

Do NOT empty into drains.

S49

Keep only in the original container.

**National classification/labeling** - Ireland

R53

May cause long-term adverse effects in the aquatic environment.

S2

Keep out of reach of children.

S13

Keep away from food, drink and animal feedingstuffs.

S35

This material and its container must be disposed of in a safe way.

S46

If swallowed, seek medical advice immediately and show this

container or label.

S57 Use appropriate containment to avoid environmental contamination.  
To avoid risks to human health and the environment, comply with the instructions for use.

## 2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

### 2.2.1. Precautionary statement/statements

P234 Keep only in original container

### 2.2.2. Supplemental hazard information

EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

### 2.2.3. Precautionary statement/statements Ireland

P234 Keep only in original container

## 2.3. Other hazards

0% of the mixture consists of ingredient/ingredients of unknown acute toxicity.

0% of the mixture consists of ingredient/ingredients of unknown hazards to the aquatic environment.

### 2.3.1. Potential environmental effects

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

Not a persistent, bioaccumulative or toxic (PBT) nor a very persistent, very bioaccumulative (vPvB) mixture.

## 2.4. Appearance and odour (colour/form/odour):

|| Brown /Liquid / Amino odour

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

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### Active ingredient

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

### Composition

Components	CAS No.	EC No.	EU Index No. / REACH Reg. No. / C&L ID No.	% by weight (approximate)	Classification
Potassium salt of glyphosate	70901-12-1	933-437-9	015-184-00-8 / - / 02-2119694167-27-0000	44	Aquatic Chronic - Category 2; H411; { c } N; R51/53; { b }
Alkylpolyglycoside	68515-73-1	500-220-1	- / 01-2119488530-36 / -	<20	Eye damage - Category 1; H318; { d } Xi; R41; { a }
Nitrotyl	226563-63-9		- / - / -	<3	Acute toxicity - Category 4, Skin irritation - Category 2, Eye damage - Category 1, Aquatic Chronic - Category 3; H302+332, 315, 318, 412Xn, Xi; R20/22, 38, 41, 52/53; { c }
Water and minor formulating ingredients			- / - / -	>33	

Full text of classification code: See section 16.

## 4. FIRST AID MEASURES

Use personal protection recommended in section 8.

### 4.1. Description of first aid measures

#### 4.1.1. Eye contact

Immediately flush with plenty of water. If easy to do, remove contact lenses. If there are persistent symptoms, obtain medical advice.

- 4.1.2. Skin contact**  
Take off contaminated clothing, wristwatch, jewellery. Wash affected skin with plenty of water. Wash clothes and clean shoes before re-use.
- 4.1.3. Inhalation**  
Remove to fresh air.
- 4.1.4. Ingestion**  
Immediately offer water to drink. Do NOT induce vomiting unless directed by medical personnel. If symptoms occur, get medical attention.

**4.2. Most important symptoms and effects, both acute and delayed**

- 4.2.1. Potential health effects**  
**Likely routes of exposure:** Skin contact, eye contact  
**Eye contact, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.  
**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.

**4.3. Indication of any immediate medical attention and special treatment needed**

- 4.3.1. Advice to doctors**  
This product is not an inhibitor of cholinesterase.
- 4.3.2. Antidote**  
Treatment with atropine and oximes is not indicated.

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**5. FIRE-FIGHTING MEASURES**

- 5.1. Extinguishing media**  
**5.1.1.** Recommended: Water, foam, dry chemical, carbon dioxide (CO<sub>2</sub>)
- 5.2. Special hazards**  
**5.2.1. Unusual fire and explosion hazards**  
Minimise use of water to prevent environmental contamination.  
Environmental precautions: see section 6.
- 5.2.2. Hazardous products of combustion**  
Carbon monoxide (CO), phosphorus oxides (P<sub>x</sub>O<sub>y</sub>), nitrogen oxides (NO<sub>x</sub>)
- 5.3. Fire fighting equipment**  
Self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.
- 5.4. Flash point**  
Does not flash.

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**6. ACCIDENTAL RELEASE MEASURES**

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

- 6.1. Personal precautions**  
Use personal protection recommended in section 8.
- 6.2. Environmental precautions**  
SMALL QUANTITIES: Low environmental hazard. LARGE QUANTITIES: Minimise spread. Keep out of drains, sewers, ditches and water ways. Notify authorities.
- 6.3. 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.

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## 7. HANDLING AND STORAGE

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

### 7.1. Precautions for safe handling

- Avoid contact with eyes.
- 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.
- Emptied containers retain vapour and product residue.
- Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

### 7.2. Conditions for safe storage

- Minimum storage temperature: -15 °C
- Maximum storage temperature: 50 °C
- Compatible materials for storage: stainless steel, fibreglass, plastic, glass lining
- Keep out of reach of children.
- Keep away from food, drink and animal feed.
- Keep only in the original container.
- Partial crystallization may occur on prolonged storage below the minimum storage temperature.
- If frozen, place in warm room and shake frequently to put back into solution.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Airborne exposure limits

Components	Exposure Guidelines
Potassium salt of glyphosate	No specific occupational exposure limit has been established.
Alkylpolyglycoside	No specific occupational exposure limit has been established.
Nitrotyl	No specific occupational exposure limit has been established.
Water and minor formulating ingredients	No specific occupational exposure limit has been established.

### 8.2. Engineering controls

No special requirement when used as recommended.

### 8.3. Recommendations for personal protective equipment

#### 8.3.1. Eye protection:

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

#### 8.3.2. Skin protection:

If repeated or prolonged contact:  
Wear chemical resistant gloves.  
Chemical resistant gloves include those made of waterproof materials such as nitrile, butyl, neoprene, polyvinyl chloride (PVC), natural rubber and/or barrier laminate.

#### 8.3.3. 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.

Colour/colour range:	Brown
Odour:	Amino odour
Form:	Liquid
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	No data.
Flash point:	Does not flash.
Explosive properties:	No explosive properties
Auto ignition temperature:	> 600 °C
Self-accelerating decomposition temperature (SADT):	No data.
Oxidizing properties:	No data.
Specific gravity:	1,3426 @ 20 °C / 4 °C
Vapour pressure:	No significant volatility; aqueous solution.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	107,2 mPa·s @ 20 °C
Kinematic viscosity:	79,83 cSt @ 20 °C
Density:	1,3426 g/cm <sup>3</sup> @ 20 °C
Solubility:	Completely miscible.
pH:	4,3 @ 10 g/l
Partition coefficient:	log Pow: -3,2 @ 25 °C (glyphosate)

## 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

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

### 10.2. Stability

Stable under normal conditions of handling and storage.

### 10.3. Possibility of hazardous reactions

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

### 10.4. Incompatible materials

Incompatible materials for storage: galvanised steel, unlined mild steel  
Compatible materials for storage: see section 7.2.

### 10.5. Hazardous decomposition

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

## 11. TOXICOLOGICAL INFORMATION

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

**Likely routes of exposure:** Skin contact, eye contact

Data obtained on product and components are summarized below.

### Acute oral toxicity

**Rat, LD50:** > 2.000 mg/kg body weight  
No mortality.

**Acute dermal toxicity**

**Rat, LD50:** > 2.000 mg/kg body weight  
No mortality.

**Skin irritation**

**Rabbit, 3 animals, OECD 404 test:**

Redness, individual EU scores: 0,3; 0,0; 0,0  
Swelling, individual EU scores: 0,0; 0,0; 0,0  
Days to heal: 5

**Eye irritation**

**Rabbit, 3 animals, OECD 405 test:**

Conjunctival redness, individual EU scores: 0,7; 1,0; 0,7  
Conjunctival swelling, individual EU scores: 1,0; 1,0; 0,7  
Corneal opacity, individual EU scores: 0,0; 0,0; 0,0  
Iris lesions, individual EU scores: 0,0; 0,0; 0,0  
Days to heal: 3  
Slightly irritating to eyes but not sufficient for classification.

**Skin sensitization**

**Guinea pig, 9-induction Buehler test:**

Negative.  
No skin sensitization

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

**Mutagenicity**

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**

**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 ppm  
Tumours: none

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations:**

NOAEL toxicity: 10.000 ppm  
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.

### Aquatic toxicity, algae/aquatic plants

#### **Green algae (*Selenastrum capricornutum*):**

Acute toxicity, 72 hours, static, ErC50 (growth rate): 118 mg/L

#### **Duckweed (*Lemna gibba*):**

Acute toxicity, 7 days, static, ErC50 (frond number): 26,8 mg/L

#### **Duckweed (*Lemna gibba*):**

Acute toxicity, 7 days, static, NOEC (growth rate): 6,9 mg/L

### Arthropod toxicity

#### **Honey bee (*Apis mellifera*):**

Contact, 48 hours, LD50: > 279 µg/bee

#### **Honey bee (*Apis mellifera*):**

Oral, 48 hours, LD50: > 282 µg/bee

### Soil organism toxicity, invertebrates

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

Acute toxicity, 14 days, LC50: > 10.000 mg/kg dry soil

### Soil organism toxicity, microorganisms

#### **Nitrogen and carbon transformation test:**

27 L/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

### Similar formulation

### Aquatic toxicity, fish

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

Acute toxicity, 96 hours, static, LC50: > 1.039 mg/L

### Aquatic toxicity, invertebrates

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

Acute toxicity, 48 hours, static, EC50: 243 mg/L

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

### Avian toxicity

#### **Bobwhite quail (*Colinus virginianus*):**

Dietary toxicity, 5 days, LC50: > 4.640 mg/kg diet

#### **Mallard duck (*Anas platyrhynchos*):**

Dietary toxicity, 5 days, LC50: > 4.640 mg/kg diet

#### **Bobwhite quail (*Colinus virginianus*):**

Acute oral toxicity, single dose, LD50: > 3.851 mg/kg body weight

### 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

### 13.1. Waste treatment methods

#### 13.1.1. Product

Keep out of drains, sewers, ditches and water ways. Follow all local/regional/national/international regulations on waste disposal. Follow current edition of the General Waste, Landfill, and Burning of Hazardous Waste Directives; the EU List of Waste; and the Shipment of Waste Regulation. Disposal in a waste incinerator with energy recovery is recommended. According to the manufacturer self-classification, following the EU Dangerous Preparations' Directive 1999/45/EC, the product can be disposed as a non-hazardous industrial waste. According to the manufacturer self-classification, following Regulation (EC) No. 1272/2008 [CLP], the product can be disposed as a non-hazardous industrial waste.

#### 13.1.2. Container

Follow all local/regional/national/international regulations on waste disposal, packaging waste collection/disposal. Follow current edition of the General Waste, Landfill, and Burning of Hazardous Waste Directives; the EU List of Waste; and the Shipment of Waste Regulation. Do NOT re-use containers. Triple or pressure rinse empty containers. Pour rinse water into spray tank. Properly rinsed container can be disposed as a non hazardous industrial waste. Store for collection by approved waste disposal service. Recycle if appropriate facilities/equipment available. Recycle the non-hazardous container only when a proper control on the end use of the recycled plastic is possible. Suitable for industrial grade recycling only. Do NOT recycle plastic that could end in any human or food contact application. This package meets the requirements for energy recovery. Disposal in a incinerator with energy recovery is recommended.

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

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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 regulated for transport under ADR/RID, IMO, or IATA/ICAO Regulations

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## 15. REGULATORY INFORMATION

### 15.1. Other Regulatory Information

SP1 Do not contaminate water with the product or its container.

### 15.2. Chemical Safety Assessment

A Chemical Safety Assessment per Regulation (EC) No. 1907/2006 is not required and has not been performed.

A Risk Assessment has been performed under Directive 91/414/EC.

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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.

This Safety Data Sheet has been prepared following the Regulation (EC) No. 1907/2006 (Annex II) as last amended by Regulation (EC) No. 453/2010

Data provided in this Safety Data Sheet are for the product as supplied unless otherwise indicated.

### Classification of components

Components	Classification
Potassium salt of glyphosate	Aquatic Chronic - Category 2 H411 Toxic to aquatic life with long lasting effects. N - Dangerous for the environment R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Alkylpolyglycoside	Eye damage - Category 1 H318 Causes serious eye damage.



	<p>Xi - Irritant R41 Risk of serious damage to eyes.</p>
Nitrotyl	<p>Acute toxicity - Category 4 Skin irritation - Category 2 Eye damage - Category 1 Aquatic Chronic - Category 3 H302+332 Harmful if swallowed or if inhaled H315 Causes skin irritation. H318 Causes serious eye damage. H412 Harmful to aquatic life with long lasting effects. Xn - Harmful Xi - Irritant R20/22 Harmful by inhalation and if swallowed. R38 Irritating to skin. R41 Risk of serious damage to eyes. R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p>
Water and minor formulating ingredients	

Endnotes:

- { a} EU label (manufacturer self-classification)
- { b} EU label (Annex I)
- { c} EU CLP classification (Annex VI)
- { d} EU CLP (manufacturer self-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)

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.

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## Safety Data Sheet (SDS) Annex

Chemical Safety Report:

Read and follow label instructions.