

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

**Product name**

**Ramrod® Flowable**

**Product use**

Herbicide

**Chemical name**

Not applicable.

**Synonyms**

None.

**Company/(Sales office)**

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**Emergency numbers**

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## 2. HAZARDS IDENTIFICATION

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

Xn - Harmful, N - Dangerous for the environment

R22 Harmful if swallowed.

R38 Irritating to skin.

R43 May cause sensitization by skin contact.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**National classification** - U.K.

Xn - Harmful, N - Dangerous for the environment

R22 Harmful if swallowed.

R38 Irritating to skin.

R43 May cause sensitization by skin contact.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Potential health effects**

**Likely routes of exposure**

Skin contact, eye contact, inhalation

**Eye contact, short term**

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

**Skin contact, short term**

Irritating to skin.

May cause allergic skin reaction.

**Inhalation, short term**

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

**Single ingestion**

Harmful if swallowed.

**Potential environmental effects**

Very toxic to aquatic organisms.  
May cause long-term adverse effects in the aquatic environment.

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

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### Active ingredient

2-Chloro-N-isopropylacetanilide; {Propachlor}

#### Composition

Components	CAS No.	EINECS/ ELINCS No.	% by weight (approximate)	EU Symbols & R phrases of components
Propachlor	1918-16-7	217-638-2	43	Xn, N; R22, 36, 43, 50/53; {b}
Ethylene glycol	107-21-1	203-473-3	7.5	Xn; R22; {b}
Minor formulating ingredients			12.5	
Water	7732-18-5	231-791-2	37	

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### 4. FIRST AID MEASURES

Use personal protection recommended in section 8.

#### Eye contact

Immediately flush with plenty of water.  
If easy to do, remove contact lenses.

#### Skin contact

Immediately wash affected skin with plenty of water.  
Continue for at least 15 minutes.  
Use soap if available.  
Pay particular attention to skin crevices, nail folds, scalp, etc.  
Take off contaminated clothing, wristwatch, jewellery.  
If spilled into boots, remove immediately.  
Wash clothes and clean shoes before re-use.  
If there are persistent symptoms, obtain medical advice.

#### Inhalation

Remove to fresh air.

#### Ingestion

Immediately give a suspension of activated charcoal to drink.  
Induce vomiting only as directed by medical personnel.  
Do NOT induce vomiting unless directed by medical personnel.  
Immediately get medical advice from a poison control center or doctor.

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### 5. FIRE-FIGHTING MEASURES

#### Flash point

Does not flash.

#### 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>), hydrogen chloride (HCl)

### **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.  
In case of insufficient ventilation, wear suitable respiratory equipment.  
Keep upwind of spillage.  
Avoid all direct contact.  
Warn everybody of toxic hazard.  
Keep all non-essential people away from affected area.

### **Environmental precautions**

Minimise spread.  
Keep out of drains, sewers, ditches and water ways.  
Notify authorities.

### **Methods for cleaning up**

Contain spillage with sand bags or other means.  
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.  
Place leaking containers in oversize leakproof drums for transport.  
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**

Only trained personnel should use this product.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin.  
Ensure that first-aid provisions are available.  
When using do not eat, drink or smoke.  
Wash hands thoroughly after handling or contact.  
Wash contaminated clothing before re-use.  
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**

Minimum storage temperature: 0 °C  
Maximum storage temperature: 40 °C  
Compatible materials for storage: stainless steel, galvanised steel, plastic  
Incompatible materials for storage: mild steel  
Keep out of reach of children.  
Keep away from food, drink and animal feed.  
Keep only in the original container.  
Use appropriate containment to avoid environmental contamination.  
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.

Minimum shelf life: 2 years.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Airborne exposure limits

Components	Exposure Guidelines
Propachlor	No specific occupational exposure limit has been established.
Ethylene glycol	TLV (ACGIH): 100 mg/m <sup>3</sup> (ceiling): The exposure limit is for aerosol only.
Minor formulating ingredients	No specific occupational exposure limit has been established.
Water	No specific occupational exposure limit has been established.

### Engineering controls

Provide adequate ventilation to keep airborne concentration below exposure limits.

### Eye protection

No special requirement when used as recommended.

### Skin protection

Wear chemical resistant gloves.  
 Wear face shield.  
 Wear chemical resistant clothing/footwear.

### 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:	White
Odour:	Odourless
Form:	Suspension
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	91 - 92 °C
Flash point:	Does not flash.
Explosive properties:	No explosive properties
Auto ignition temperature:	515 °C
Specific gravity:	1.11 @ 20 °C / 4 °C
Vapour pressure:	No significant volatility.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	~ 0.09 Pa.s @ 20 °C @ 158.8 1/s
Kinematic viscosity:	Not applicable.
Density:	1.1154 g/cm <sup>3</sup> @ 20 °C
Solubility:	Water: Completely miscible.
pH:	~ 6.4 @ 23 °C
Partition coefficient:	log Pow: 2.23 @ 21.5 °C (propachlor)

## 10. STABILITY AND REACTIVITY

### Stability

Stable under normal conditions of handling and storage.

### Oxidizing properties

No data.

### Materials to avoid/Reactivity

Corrosive to mild steel.

### Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.  
When heated may give off toxic fumes.

### Self-accelerating decomposition temperature (SADT)

No data.

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## 11. TOXICOLOGICAL INFORMATION

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

Data obtained on product and components are summarized below.

### Acute oral toxicity

**Rat, LD50:** 1,191 mg/kg body weight

### Acute dermal toxicity

**Rat, LD50 (limit test):** > 5,000 mg/kg body weight

Other effects: weight loss

No mortality.

### Acute inhalation toxicity

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

No 4-hr LC50 at the maximum achievable concentration.

### Skin irritation

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

Redness, mean EU score: 2.64

Swelling, mean EU score: 1.97

Days to heal: 14

### Eye irritation

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

Conjunctival redness, mean EU score: 0.83

Conjunctival swelling, mean EU score: 0.28

Corneal opacity, mean EU score: 0.00

Iris lesions, mean EU score: 0.00

Days to heal: 7

### Propachlor

### Skin sensitization

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

Positive.

### Mutagenicity

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

Not mutagenic.

### Repeated dose toxicity

**Rat, dermal, 21 days:**

NOAEL toxicity: 500 mg/kg body weight/day

Target organs/systems: none

Other effects: none

**Mouse, oral, 3 months:**

NOAEL toxicity: 500 mg/kg diet

Target organs/systems: liver, kidneys

Other effects: decrease of body weight gain, haematological effects, histopathologic effects

**Rat, oral, 3 months:**

NOAEL toxicity: 13 mg/kg body weight/day

Target organs/systems: liver, spleen

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

**Chronic effects/carcinogenicity**

**Rat, oral, 2 years:**

NOEL tumour: 100 mg/kg diet

NOAEL toxicity: 100 mg/kg diet

Tumours: stomach (carcinoma)

Target organs/systems: liver, stomach

Other effects: organ weight change, haematological effects, blood biochemistry effects

**Mouse, oral, 18 months:**

NOEL tumour: 100 mg/kg diet

NOAEL toxicity: 100 mg/kg diet

Tumours: liver (adenoma) (carcinoma)

Target organs/systems: liver, stomach

Other effects: organ weight change, histopathologic effects

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations:**

NOAEL toxicity: 7.1 mg/kg body weight

NOAEL reproduction: 69.6 mg/kg body weight

Other effects in parents: decrease of body weight gain, decrease of food consumption

Other effects in pups: weight loss, decrease of litter size

**Developmental toxicity/teratogenicity**

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

NOAEL toxicity:  $\geq$  200 mg/kg body weight/day

NOAEL development:  $\geq$  200 mg/kg body weight/day

Other effects in mother animal: none

Developmental effects: none

**Rabbit, oral, 7 - 19 days of gestation:**

NOAEL toxicity: 25 mg/kg body weight

NOAEL development:  $\geq$  125 mg/kg body weight

Other effects in mother animal: decrease of survival

Developmental effects: none

**Acute neurotoxicity**

**Rat, oral, 1 day, gavage:**

NOEL: 175 mg/kg body weight

Not neurotoxic.

**Repeated dose neurotoxicity**

**Rat, oral, 13 weeks, dietary:**

NOAEL: 55.8 mg/kg body weight/day

Not neurotoxic.

**EXPERIENCE WITH HUMAN EXPOSURE**

**Skin contact, repeated, occupational:**

**Skin effects:** sensitization in susceptible individuals

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**12. ECOLOGICAL INFORMATION**

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

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

**Soil organism toxicity, microorganisms**

**Nitrogen and carbon transformation test:**

40 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: 0.42 mg/L

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

Acute toxicity, 96 hours, static, LC50: 1.6 mg/L

#### **Aquatic toxicity, invertebrates**

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

Acute toxicity, 48 hours, static, EC50: 13 mg/L

#### **Propachlor**

#### **Aquatic toxicity, algae/aquatic plants**

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

Acute toxicity, 72 hours, static, ErC50 (growth rate): 23 µg/L

Plant recovers when toxicant is removed.

#### **Avian toxicity**

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

Acute oral toxicity, single dose, LD50: 91 mg/kg body weight

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

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

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

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

#### **Arthropod toxicity**

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

Oral, 72 hours, LD50: > 197 µg/bee

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

Contact, 72 hours, LD50: > 200 µg/bee

#### **Soil organism toxicity, invertebrates**

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

Acute toxicity, 14 days, LC50: 218 mg/kg dry soil

#### **Bioaccumulation**

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

Whole fish: BCF: 34

Rapid depuration after end of exposure.

#### **Dissipation**

##### **Soil, 25 °C:**

Half life: 1.8 - 6.2 days

Koc: 73 - 138

##### **Water, 20 °C:**

Half life: 4.7 - 5.6 days

#### **Biodegradation**

Not readily biodegradable.

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## **13. DISPOSAL CONSIDERATIONS**

### **Product**

Recycle if appropriate facilities/equipment available.

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

Burn in special, controlled high temperature incinerator.

Dispose of as hazardous industrial waste.

Follow all local/regional/national/international regulations.

### **Container**

See the individual container label for disposal information.

Empty packaging completely.

Triple or pressure rinse empty containers.

Pour rinse water into spray tank.

Do NOT re-use containers.

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.

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.

### ADR/RID

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (propachlor)  
UN No.: UN3082  
Class: 9  
Kemler: 90  
Packing Group: III

### IMO

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (propachlor)  
UN No.: UN3082  
Class: 9  
Packing Group: III

MARINE POLLUTANT

### IATA/ICAO

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (propachlor)  
UN No.: UN3082  
Class: 9  
Packing Group: III

MARINE POLLUTANT

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## 15. REGULATORY INFORMATION

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

Xn - Harmful, N - Dangerous for the environment	
R22	Harmful if swallowed.
R38	Irritating to skin.
R43	May cause sensitization by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S24	Avoid contact with skin.
S35	This material and its container must be disposed of in a safe way.
S37	Wear suitable gloves.
S57	Use appropriate containment to avoid environmental contamination.

**National classification** - U.K.

Xn - Harmful, N - Dangerous for the environment	
R22	Harmful if swallowed.
R38	Irritating to skin.
R43	May cause sensitization by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S24	Avoid contact with skin.
S35	This material and its container must be disposed of in a safe way.
S37	Wear suitable gloves.
S57	Use appropriate containment to avoid environmental contamination.

## 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.

This Safety Data Sheet has been prepared following the EU Directive 91/155/EEC as last amended by EU Directive 2001/58/EC.

In this document the British spelling was applied.

® Registered trademark.

|| Significant changes versus previous edition.

### EU Symbols & R phrases of components

Components	EU Symbols & R phrases of components
Propachlor	Xn - Harmful N - Dangerous for the environment R22 Harmful if swallowed. R36 Irritating to eyes. R43 May cause sensitization by skin contact. R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Ethylene glycol	Xn - Harmful R22 Harmful if swallowed.
Minor formulating ingredients	
Water	

### 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)

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