

**MONSANTO Europe S.A.**  
Material Safety Data Sheet  
Commercial Product

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**  
**Hockey® Pro**

**Product use**  
Herbicide

**Chemical name**  
Not applicable.

**Synonyms**  
None.

**Company**  
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## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**  
Isopropylamine salt of N-(phosphonomethyl)glycine; { Isopropylamine salt of glyphosate }  
3-(3,4-dichlorophenyl)-1,1-dimethylurea; { Diuron }

### Composition

Components	CAS No.	EINECS/ ELINCS No.	% by weight (approximate)	EU Symbols & R phrases of components
Isopropylamine salt of glyphosate	38641-94-0	254-056-8	13	
Diuron	330-54-1		12	Xn, N; R22, 40, 48/22, 50/53; {b}
Refined mineral oil			24	
Minor formulating ingredients			3.5	
Water	7732-18-5	231-791-2	47.5	

## 3. HAZARDS IDENTIFICATION

**EU label (manufacturer self-classification)** - Classification following the EU Dangerous Preparations Directive 88/379/EEC.

Xn - Harmful  
R48/22 Harmful: danger of serious damage to health by prolonged exposure if swallowed.

### 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.

### **Potential environmental effects**

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.

If easy to do, remove contact lenses.

### **Skin contact**

Take off contaminated clothing, wristwatch, jewellery.

If spilled into boots, remove immediately.

Wash affected skin with plenty of water.

Pay particular attention to skin crevices, nail folds, scalp, etc.

Wash clothes and clean shoes before re-use.

### **Inhalation**

Remove to fresh air.

### **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.

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

### **Environmental precautions**

SMALL QUANTITIES:

Low environmental hazard.

LARGE QUANTITIES:

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

Notify authorities.

### 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.

### Handling

When using do not eat, drink or smoke.

Wash hands thoroughly after handling or contact.

Avoid prolonged or repeated contact with skin.

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 for disposal of rinse water.

Emptied containers retain vapour and product residue.

### Storage

Minimum storage temperature: 0 °C

Maximum storage temperature: 40 °C

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

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.

Keep container tightly closed in a cool, well-ventilated place.

Minimum shelf life: 2 years.

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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.
Diuron	TLV (ACGIH): 10 mg/m <sup>3</sup> (TWA)
Refined mineral oil	Manufacturer suggested exposure limit: 5 mg/m <sup>3</sup> (TWA)
Minor formulating ingredients	No specific occupational exposure limit has been established.
Water	No specific occupational exposure limit has been established.

### Engineering controls

No special requirement when used as recommended.

### Eye protection

No special requirement when used as recommended.

### Skin protection

If repeated or prolonged contact:  
Wear chemical resistant gloves.  
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.

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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:	Colourless - Whitish
Form:	Suspension (oily)
Odour:	Slight
Flash point:	Does not flash.
Specific gravity:	1.053 @ 20 °C / 4 °C
Solubility:	Water: Emulsifies.
pH:	3.6 @ 20 g/l
Partition coefficient (log Pow):	< 0.000 (glyphosate)
Partition coefficient (log Pow):	2.77 (diuron)

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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.

#### **More concentrated formulation**

##### **Acute oral toxicity**

**Rat, LD50 (limit test):** > 5,000 mg/kg body weight  
No mortality.

##### **Acute dermal toxicity**

**Rat, LD50 (limit test):** > 4,000 mg/kg body weight  
No mortality.

##### **Skin irritation**

**Rabbit, 3 animals, OECD 404 test:**  
Redness, individual EU scores: 0.7; 1.0; 0.7  
Swelling, individual EU scores: 0.0; 0.3; 0.0  
Days to heal: 7

##### **Eye irritation**

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

Conjunctival redness, individual EU scores: 0.00; 0.00; 0.00  
Conjunctival swelling, individual EU scores: 0.00; 0.00; 0.00  
Corneal opacity, individual EU scores: 0.00; 0.00; 0.00  
Iris lesions, individual EU scores: 0.00; 0.00; 0.00  
Days to heal: 1

#### **Skin sensitization**

##### **Guinea pig, Buehler test:**

Positive incidence: 0 %  
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

#### **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, 3 generations:**

NOAEL toxicity: > 30 mg/kg body weight  
NOAEL reproduction: > 30 mg/kg body weight  
Target organs/systems in parents: none  
Other effects in parents: none  
Target organs/systems in pups: none  
Other effects in pups: none

#### **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

#### **Diuron**

### **Mutagenicity**

#### **In vitro mutagenicity test(s):**

Not mutagenic.

#### **In vivo chromosomal aberration test(s):**

Mutagenic.

### **Carcinogenicity**

#### **Rat, oral, 2 years:**

LOAEL toxicity: 1.02 mg/kg body weight/day

Tumours: urinary bladder (carcinoma), kidneys (carcinoma)

Target organs/systems: bone marrow, spleen, urinary bladder

Other effects: haematological effects, organ weight change, histopathologic effects

#### **Mouse, oral:**

NOEL tumour: 64.2 mg/kg body weight/day

NOAEL toxicity: 64.2 mg/kg body weight/day

Tumours: mammary gland (carcinoma)

Target organs/systems: kidneys, liver, urinary bladder, uterus

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

### **Toxicity to reproduction/fertility**

#### **Rat, oral, 2 generations:**

NOAEL toxicity: 18.6 mg/kg body weight/day

NOAEL reproduction: 18.6 mg/kg body weight/day

Target organs/systems in parents: none

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

Target organs/systems in pups: none

Other effects in pups: decrease of body weight gain

### **Developmental toxicity/teratogenicity**

#### **Rat, oral, days of gestation:**

NOEL toxicity: 16 mg/kg body weight/day

NOEL development: 80 mg/kg body weight/day

Target organs/systems in mother animal: none

Other effects in mother animal: weight loss, decrease of food consumption

Developmental effects: delayed ossification, weight loss

#### **Rabbit, oral, days of gestation:**

NOEL toxicity: 10 mg/kg body weight/day

NOEL development: > 50 mg/kg body weight/day

Target organs/systems in mother animal: none

Other effects in mother animal: weight loss, decrease of food consumption

Developmental effects: none

No adverse treatment related effects in offspring.

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## **12. ECOLOGICAL INFORMATION**

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

Data obtained on product and components are summarized below.

### **Aquatic toxicity, fish**

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

Acute toxicity, 96 hours, static, LC50: 58.2 mg/L

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

### **Aquatic toxicity, invertebrates**

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

Acute toxicity, 48 hours, static, EC50: 780 mg/L

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

#### **Diatom (*Skeletonema costatum*):**

Acute toxicity, 4 days, static, EC50: 1.3 mg/L

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

Acute toxicity, 14 days, static, EC50: 25.5 mg/L

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

Acute toxicity, 72 hours, static, ErC50 (growth rate): 450 mg/L

#### **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

#### **Arthropod toxicity**

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

Oral, 48 hours, LD50: 100 µg/bee

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

Contact, 48 hours, LD50: > 100 µg/bee

#### **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

#### **Diuron**

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

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

Acute toxicity, 48 hours, static, EC50: 8.4 mg/L

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

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

Acute toxicity, 96 hours, static, EC50: 2.4 µg/L

#### **Avian toxicity**

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

Acute oral toxicity, single dose, LD50: > 2,000 mg/kg body weight

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

Dietary toxicity, 5 days, LC50: 1,730 mg/kg diet

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

Dietary toxicity, 5 days, LC50: > 5,000 mg/kg diet

#### **Arthropod toxicity**

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

Contact, 48 hours, LD50: 145 µg/bee

#### **Bioaccumulation**

##### **Fathead minnow (*Pimephales promelas*):**

Whole fish: BCF: 20

#### **Dissipation**

##### **Soil, aerobic:**

Half life: 90 - 180 days

Koc: 480

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## **13. DISPOSAL CONSIDERATIONS**

### **Product**

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

### **Container**

Triple or pressure rinse empty containers.  
 Pour rinse water into spray tank.  
 Store for collection by approved waste disposal service.  
 Dispose of as non hazardous industrial waste.  
 Do NOT re-use containers.  
 Follow all local/regional/national/international regulations.  
**BULK CONTAINERS:**  
 Obtain from supplier and follow special handling instructions.  
 When empty, store for collection by supplier or tank cleaning company.  
 To be cleaned only by specialised company.

## 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. , (diuron)  
 UN No.: UN3082  
 Class: 9  
 Kemler: 90  
 Packing Group: III

### IMO

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

### IATA/ICAO

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

## 15. REGULATORY INFORMATION

**EU label (manufacturer self-classification)** - Classification following the EU Dangerous Preparations Directive 88/379/EEC.

Xn - Harmful  
 R48/22 Harmful: danger of serious damage to health by prolonged exposure if swallowed.  
 S2 Keep out of reach of children.  
 S13 Keep away from food, drink and animal feedingstuffs.  
 S20/21 When using do not eat, drink or smoke.  
 S44 If you feel unwell, seek medical advice (show the label where possible).

## 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.

® Registered trademark.

### EU Symbols & R phrases of components

Components	EU Symbols & R phrases of components
Isopropylamine salt of glyphosate	
Diuron	Xn - Harmful N - Dangerous for the environment R22 Harmful if swallowed. R40 Possible risks of irreversible effects. R48/22 Harmful: danger of serious damage to health by prolonged exposure if swallowed. R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic

	environment.
Refined mineral oil	
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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