

SECTION 1: Identification

1.1. Product identifier

Product form	: Mixture
Trade name	: Raphanex (Diflufenican 500 g/l)
Type of product	: Herbicide
CAS-No.	: 83164-33-4
Product group	: End product

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: A suspension concentrate herbicide for the pre- and post-emergence control of certain broadleaf weeds
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1.3. Supplier's details

Supplier

Farm-Ag International (Pty) Ltd
Old Mill Industrial Park
61, Marshall Drive
P.O. Box 1523
4300 Mount Edgecombe – Durban KwaZulu Natal
South Africa
T 031 003 3486

1.4. Emergency telephone number

Emergency number	: 24 Hr Emergency Number: In case of Poisoning: Poison Information Helpline : 0861 555 777
	In case of Spillage: HAZMAT:0800 147 112

SECTION 2: Hazards identification



2.1. Classification of the substance or mixture

Classification according to the United Nations GHS

Acute toxicity (dermal), Category 5	H313
Specific target organ toxicity – Single exposure, Category 2	H371
Hazardous to the aquatic environment – Acute Hazard, Category 1	H400
Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410
Full text of H-statements: see section 16	

2.2. Label elements

Labelling according to the United Nations GHS

Hazard pictograms (GHS ZA)	:  
Signal word (GHS-ZA)	: Warning
Hazardous ingredients	: Diflufenican 97% TC, Polyethylene glycol
Hazard statements (GHS ZA)	: H313 - May be harmful in contact with skin H371 - May cause damage to organs. H410 - Very toxic to aquatic life with long lasting effects.
Precautionary statements (GHS ZA)	: P101 - If medical advice is needed, have product container or label at hand. P102 - Keep out of reach of children.

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P103 - Read label before use.
P260 - Do not breathe vapours, spray.
P264 - Wash hands, forearms and face thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P273 - Avoid release to the environment.
P308+P311 - IF exposed or concerned: Call a POISON CENTER or doctor.
P312 - Call a POISON CENTER or doctor if you feel unwell.
P391 - Collect spillage.
P405 - Store locked up.
P501 - Dispose of contents and container to an approved waste disposal plant.

2.3. Other hazards

Adverse physicochemical, human health and environmental effects : May cause damage to organs, Harmful in contact with skin, Very toxic to aquatic life with long lasting effects.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
Diflufenican 97% TC	CAS-No.: 83164-33-4	≥ 40 – < 45	Acute Tox. Not classified (Oral) Acute Tox. 5 (Dermal), H313 Acute Tox. Not classified (Inhalation:dust,mist) STOT SE 2, H371 Aquatic Acute 1, H400 (M=1000) Aquatic Chronic 1, H410 (M=1000)
Polyethylene glycol	CAS-No.: 25322-68-3	≥ 1 – < 5	Flam. Liq. Not classified Acute Tox. 5 (Oral), H303 Acute Tox. 5 (Dermal), H313 Eye Irrit. 2A, H319 STOT SE 3, H335 STOT RE Not classified Aquatic Acute Not classified Aquatic Chronic Not classified

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : IF exposed or concerned: Get medical advice/attention. Call a poison center or a doctor if you feel unwell.
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact : Wash skin with plenty of water. Take off contaminated clothing.
First-aid measures after eye contact : Rinse eyes with water as a precaution.
First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell.

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

Symptoms/effects after skin contact : May be harmful in contact with skin.

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

Treat symptomatically.

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according to SANS 10234:2019 and SANS 11014:2010

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.
- Unsuitable extinguishing media : Water spray as a fog can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Do not use direct jet of water. Contain water used for fire-fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

5.2. Special hazards arising from the substance or mixture

- Hazardous decomposition products in case of fire : If involved with a fire, the dehydrated components may emit oxides of carbon, oxides of nitrogen and fluorine compounds including hydrofluoric acid.

5.3. Advice for firefighters

- Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.
- Personal protection (Emergency response) : Wear respiratory protection, Wear protective gloves, Wear protective clothing, Wear eye protection, Wear a face shield



SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

No additional information available

6.1.1. For non-emergency personnel

- Emergency procedures : Ventilate spillage area. Do not breathe vapours, spray. Avoid contact with skin, eyes and clothing.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Do not allow entering drains or watercourses. Spillage or uncontrolled discharges into water courses (or public waters) to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

6.3. Methods and material for containment and cleaning up

- For containment : Collect spillage.
- Methods for cleaning up : Contain spill and absorb with clay, sand, soil or proprietary absorbent (such as vermiculite). Collect spilled material and waste in sealable open-top type containers for disposal.
- Other information : Dispose of materials or solid residues at an authorized site.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Do not breathe vapours, spray. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment.
- Hygiene measures : Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Store locked up. Store in a well-ventilated place. Keep cool.

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according to SANS 10234:2019 and SANS 11014:2010

Storage area	: Keep only in the original container. Store out of reach of unauthorised persons, children and animals.
Information on mixed storage	: KEEP SUBSTANCE AWAY FROM: Food supplies. Water supplies.
Maximum storage period	: 2 years

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls	: Ensure good ventilation of the work station.
Environmental exposure controls	: Avoid release to the environment.

8.3. Individual protection measures, such as personal protective equipment (PPE)

Hand protection	: Protective gloves
Eye protection	: Safety glasses
Skin and body protection	: Wear suitable protective clothing
Respiratory protection	: In case of insufficient ventilation, wear suitable respiratory equipment

Personal protective equipment symbol(s):



8.4. Exposure limit values for the other components

No additional information available

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Viscous liquid.
Colour	: Light brown.
Odour	: No data available
Odour threshold	: No data available
pH	: 8.2
pH solution	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: No data available
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: > 100 °C
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not flammable
Vapour pressure	: No data available
Vapour pressure at 50 °C	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Relative density of saturated gas/air mixture	: No data available
Density	: No data available
Relative gas density	: No data available
Solubility	: Dispersible.
Partition coefficient n-octanol/water (Log Pow)	: No data available
Partition coefficient n-octanol/water (Log Kow)	: No data available

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according to SANS 10234:2019 and SANS 11014:2010

Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: Not explosive.
Oxidising properties	: No data available
Explosive limits	: No data available
Lower explosion limit	: No data available
Upper explosion limit	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Spray solutions containing this product should be mixed, stored or applied using stainless steel, aluminium, fibreglass or plastic-lined containers. The product is relatively stable in neutral, weakly acidic and weakly alkaline media. The product is compatible with most other pesticides when used at normal rates. However, a compatibility test is required before using with other products. Do not physically mix concentrate directly with other herbicides or pesticide concentrates, always dilute first.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: May be harmful in contact with skin.
Acute toxicity (inhalation)	: Not classified

Raphanex (Diflufenican 500 g/l) (83164-33-4)

ATE ZA (Dermal)	2515.35 mg/kg bodyweight
Unknown acute toxicity (GHS ZA)Unknown acute toxicity (GHS ZA)	43.83% of the mixture consists of ingredient(s) of unknown acute toxicity (Oral) 52.48% of the mixture consists of ingredient(s) of unknown acute toxicity (Dermal) 99.71% of the mixture consists of ingredient(s) of unknown acute toxicity (Inhalation (Vapours))

Diflufenican 97% TC (83164-33-4)

LD50 oral rat	> 5000 mg/kg (Rat, Oral)
LD50 dermal rat	> 2000 mg/kg (OECD 402: Acute Dermal Toxicity, Rat, Dermal)
LC50 Inhalation - Rat	> 5.12 mg/l (US EPA, 4 h, Rat, Inhalation)

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Xanthan gum (11138-66-2)	
LD50 oral rat	45000 mg/kg
Polyethylene glycol (25322-68-3)	
LD50 oral rat	> 2000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline 423 (Acute Oral toxicity - Acute Toxic Class Method)
LD50 dermal rat	> 2000 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)
1,2-Benzisothiazolin-3-one (2634-33-5)	
LD50 oral rat	490 mg/kg bodyweight (Equivalent or similar to OECD 401, Rat, Male / female, Experimental value, Oral, 14 day(s))
LD50 dermal rat	> 2000 mg/kg bodyweight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Dermal, 14 day(s))
poly(dimethylsiloxane) (9016-00-6)	
LD50 oral rat	> 5000 mg/kg (Rat, Literature study, Oral)
Water (7732-18-5)	
LD50 oral rat	90000 mg/kg
Skin corrosion/irritation	: Not classified pH: 8.2
Serious eye damage/irritation	: Not classified pH: 8.2
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: May cause damage to organs.
Diflufenican 97% TC (83164-33-4)	
NOAEL (oral, rat)	500 mg/kg bodyweight
STOT-single exposure	May cause damage to organs.
Polyethylene glycol (25322-68-3)	
STOT-single exposure	May cause respiratory irritation.
1,2-Benzisothiazolin-3-one (2634-33-5)	
STOT-single exposure	May cause respiratory irritation.
STOT-repeated exposure	: Not classified
Polyethylene glycol (25322-68-3)	
LOAEL (oral, rat, 90 days)	16000 mg/kg bodyweight Animal: rat
NOAEL (oral, rat, 90 days)	8000 mg/kg bodyweight Animal: rat
NOAEC (inhalation, rat, dust/mist/fume, 90 days)	1 mg/l air Animal: rat
Aspiration hazard	: Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Very toxic to aquatic life with long lasting effects.
Hazardous to the aquatic environment, short-term (acute)	: Very toxic to aquatic life.

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Hazardous to the aquatic environment, long-term (chronic) : Very toxic to aquatic life with long lasting effects.

Diflufenican 97% TC (83164-33-4)	
LC50 - Fish [1]	> 0.109 mg/l Rainbow trout
LC50 - Fish [2]	> 0.0985 mg/l Carp
ErC50 algae	0.00058 mg/l Pseudokirchneriella subcapitata
ErC50 other aquatic plants	0.00036 mg/l Scenedesmus subspicatu
BCF - Fish [1]	1500 (Salmo gairdneri)
Partition coefficient n-octanol/water (Log Kow)	4.2
Additional ecotoxicological information	Birds: Acute oral LD50 (14d) for quail >2150, mallard ducks >4000 mg/kg. Dietary LC50 (5d) for bobwhite quail >5902 mg/kg diet. Bees (LD50, µg/bee) >100 (contact); >112.3 (oral). Worms LC50 (14d) for Eisenia fetida >1000 mg/kg soil.
Xanthan gum (11138-66-2)	
LC50 - Fish [1]	420 mg/l Source: ECOTOX
Polyethylene glycol (25322-68-3)	
LC50 - Fish [1]	> 100 mg/l Test organisms (species): Poecilia reticulata
EC50 - Crustacea [1]	> 100 mg/l Test organisms (species): Daphnia magna
NOEC (chronic)	17475.27 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC chronic fish	13671.59 mg/l Test organisms (species): other: Duration: '28 d'
1,2-Benzisothiazolin-3-one (2634-33-5)	
LC50 - Fish [1]	2.18 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Oncorhynchus mykiss, Static system, Experimental value, Nominal concentration)
EC50 - Crustacea [1]	2.94 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Experimental value, Lethal)
ErC50 algae	150 µg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Experimental value, GLP)
BCF - Fish [1]	6.62 (Equivalent or similar to OECD 305, 56 day(s), Lepomis macrochirus, Experimental value, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	-0.9 – 0.99 (Experimental value, EU Method A.8: Partition Coefficient, 20 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	0.97 (log Koc, OECD 121: Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC), Experimental value, GLP)
poly(dimethylsiloxane) (9016-00-6)	
LC50 - Fish [1]	> 10000 mg/l (96 h, Salmo gairdneri, Static system, Literature study)
BCF - Fish [1]	2.9 – 1250 (3 day(s), Hypophthalmichthys molitrix, Literature study)
Water (7732-18-5)	
Partition coefficient n-octanol/water (Log Pow)	-1.38
12.2. Persistence and degradability	
Raphanex (Diflufenican 500 g/l) (83164-33-4)	
Persistence and degradability	No additional information available
Diflufenican 97% TC (83164-33-4)	
Persistence and degradability	Not readily biodegradable in water.

Raphanex (Diflufenican 500 g/l)

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according to SANS 10234:2019 and SANS 11014:2010

1,2-Benzisothiazolin-3-one (2634-33-5)

Persistence and degradability	Not readily biodegradable in water.
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poly(dimethylsiloxane) (9016-00-6)

Persistence and degradability	Biodegradable in the soil. Not readily biodegradable in water.
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12.3. Bioaccumulative potential

Raphanex (Diflufenican 500 g/l) (83164-33-4)

Bioaccumulative potential	No additional information available
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Diflufenican 97% TC (83164-33-4)

BCF - Fish [1]	1500 (Salmo gairdneri)
Partition coefficient n-octanol/water (Log Kow)	4.2
Bioaccumulative potential	Potential for bioaccumulation ($500 \leq \text{BCF} \leq 5000$).

1,2-Benzisothiazolin-3-one (2634-33-5)

BCF - Fish [1]	6.62 (Equivalent or similar to OECD 305, 56 day(s), Lepomis macrochirus, Experimental value, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	-0.9 – 0.99 (Experimental value, EU Method A.8: Partition Coefficient, 20 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	0.97 (log Koc, OECD 121: Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC), Experimental value, GLP)
Bioaccumulative potential	Low potential for bioaccumulation ($\text{BCF} < 500$).

poly(dimethylsiloxane) (9016-00-6)

BCF - Fish [1]	2.9 – 1250 (3 day(s), Hypophthalmichthys molitrix, Literature study)
Bioaccumulative potential	No straightforward conclusion can be drawn based upon the available numerical values.

Water (7732-18-5)

Partition coefficient n-octanol/water (Log Pow)	-1.38
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12.4. Mobility in soil

Raphanex (Diflufenican 500 g/l) (83164-33-4)

Mobility in soil	No additional information available
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Diflufenican 97% TC (83164-33-4)

Partition coefficient n-octanol/water (Log Kow)	4.2
Ecology - soil	Adsorbs into the soil.

1,2-Benzisothiazolin-3-one (2634-33-5)

Surface tension	72.6 mN/m (20 °C, 0.1 %, EU Method A.5: Surface tension)
Partition coefficient n-octanol/water (Log Pow)	-0.9 – 0.99 (Experimental value, EU Method A.8: Partition Coefficient, 20 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	0.97 (log Koc, OECD 121: Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC), Experimental value, GLP)
Ecology - soil	Highly mobile in soil.

poly(dimethylsiloxane) (9016-00-6)

Ecology - soil	Adsorbs into the soil. Low potential for mobility in soil. Not toxic to plants.
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Raphanex (Diflufenican 500 g/l)

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according to SANS 10234:2019 and SANS 11014:2010

Water (7732-18-5)

Partition coefficient n-octanol/water (Log Pow) : -1.38

12.5. Other adverse effects

Ozone : Not classified
Other adverse effects : No additional information available




SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

In accordance with SANS / IMDG / IATA

SANS	IMDG	IATA
14.1. UN number		
3082	3082	3082
14.2. Proper Shipping Name		
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains diflufenican 500 g/l)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains diflufenican 500 g/l)	Environmentally hazardous substance, liquid, n.o.s. (contains diflufenican 500 g/l)
14.3. Transport hazard class(es)		
9	9	9
		
14.4. Packing group		
III	III	III
14.5. Environmental hazards		
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes
No supplementary information available		

14.6. Special precautions for user

SANS

Special provisions (SANS) : 179, 274, 331, 335
Limited quantities (SANS) : 5 L
Limited quantities (SANS) : 5 L
Packagings, large packagings and IBCs Packing instructions (SANS) : P001, IBC03, LP01
Packagings, large packagings and IBCs Special packing instructions (SANS) : PP1
Portable tank and bulk containers instructions (SANS) : T4
Portable tank and bulk container special provisions (SANS) : TP1, TP29

IMDG

Special provisions (IMDG) : 274, 335, 969

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Limited quantities (IMDG)	: 5 L
Excepted quantities (IMDG)	: E1
Packing instructions (IMDG)	: LP01, P001
Special packing provisions (IMDG)	: PP1
IBC packing instructions (IMDG)	: IBC03
Tank instructions (IMDG)	: T4
Tank special provisions (IMDG)	: TP1, TP29
EmS-No. (Fire)	: F-A - FIRE SCHEDULE Alfa - GENERAL FIRE SCHEDULE
EmS-No. (Spillage)	: S-F - SPILLAGE SCHEDULE Foxtrot - WATER-SOLUBLE MARINE POLLUTANTS
Stowage category (IMDG)	: A

IATA

PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Y964
PCA limited quantity max net quantity (IATA)	: 30kgG
PCA packing instructions (IATA)	: 964
PCA max net quantity (IATA)	: 450L
CAO packing instructions (IATA)	: 964
CAO max net quantity (IATA)	: 450L
Special provisions (IATA)	: A97, A158, A197, A215
ERG code (IATA)	: 9L

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health, and environmental national regulations specific for the product

No additional information available

SECTION 16: Other information

Issue date : 11/09/2022

Full text of H-statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H303	May be harmful if swallowed
H313	May be harmful in contact with skin
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H371	May cause damage to organs.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Safety Data Sheet (SDS), South Africa

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.