



## SECTION 1 - PRODUCT & COMPANY IDENTIFICATION

ARYSTA LifeScience South Africa (Pty) Ltd  
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Substance: difenoconazole  
Product Name: **Navigator 250 EC**  
Product Use: Fungicide  
Creation Date: Nov 2010  
Revision Date: August 2019

### 24 Hr Emergency Number:

#### In case of Poisoning:

Poisons Helpline 0861 555 777

#### In case of Spillage:

Spill Tech Oil & Chemical Pollution Control 086 100 0366 / 083 253 6618

## SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Common Name: difenoconazole  
Chemical Name: *cis,trans*-3-chloro-4-[4-methyl-2-(1*H*-1,2,4-triazol-1-ylmethyl)-1,3-dioxolan-2-yl]phenyl 4-chlorophenyl ether (IUPAC)  
CAS No.: 119446-68-3  
Chemical Family: triazole  
Chemical Formula: C<sub>19</sub>H<sub>17</sub>Cl<sub>2</sub>N<sub>3</sub>O<sub>3</sub>  
Molecular weight: 406.3  
Formulation: difenoconazole: 250 g/l  
Emusifiable concentrate

**Use & Mode of Action:** Sterol demethylation inhibitor. Inhibits cell membrane ergosterol biosynthesis, stopping development of the fungus. Systemic fungicide with preventive and curative action. Absorbed by the leaves, with acropetal and strong translaminar translocation.

### Hazardous ingredients of toxicological concern:

Inert:	concern:	% present:
difenoconazole	environmental hazard	> 25 %
Aromatic hydrocarbon	aspiration risk, irritant, Harmful	± 65 %
Benzene sulphonate and Phenol ethoxylate	irritant	± 5 %
Ethoxylated alcohol	irritant	± 5 %

**SYMBOLS:** Xn, N

**RISK-PHRASE(S):** R7, R22, R36/37/38, R40, R50/51/52/53, R65

## SECTION 3 - HAZARD IDENTIFICATION

**Toxicity class:** WHO III (a.i.). Slightly hazardous/Caution.

**Skin contact:** May cause moderate irritation to the skin.

**Eye contact:** May cause moderate irritation to the eyes.

**Inhalation:** May cause mucous membrane irritation, however, unlikely.

**Ingestion:** Low toxicity. No case of human poisoning due to this product is on record. The poisoning symptoms observed for laboratory mammals were non-specific.

**Environmental hazard:** Very toxic to fish.

## SECTION 4 - FIRST AID MEASURES AND PRECAUTIONS

**Inhalation:**

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Remove source of contamination or move victim to fresh air. Keep patient under observation and obtain medical attention if irritation persists.

**Skin contact:**

Immediately remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Gently wipe off excess chemical. Wash skin gently and thoroughly with large amount of water and non-abrasive soap. If irritation persists, obtain medical attention.

**Eye contact:**

Immediately flush the contaminated eyes with gently flowing water for 20 minutes, holding the eyelid(s) open until no evidence of chemical remains. If irritation persists, obtain medical attention.

**Ingestion:**

**Do not induce vomiting.** Get medical attention immediately. Have victim rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen. Administration of gastric lavage or oxygen should be performed by qualified medical personnel.

**Advice to physician:**

This product contains an aromatic solvent. If product is aspirated into the lungs during ingestion or vomiting, mild to severe pulmonary injury may be caused.

No signs and symptoms of poisoning are known or expected in humans. No specific antidote is available. Treat symptomatically and supportively when required. When large amounts have been ingested, consider gastric lavage or administer activated charcoal.

## SECTION 5 - FIRE-FIGHTING MEASURES

**Fire/Explosion hazard:**

**Product is slightly flammable. Combustible.**

**Flash point: 60°C**

**Extinguishing agents:**

Extinguish fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Use as little water as possible. Use spray or fog. Solid stream may cause spreading. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

**Fire fighting:**

Remove spectators from surrounding area. Isolate the fire area and evacuate downwind. Use a recommended extinguishing agent for the type of surrounding fire.

Fight fire from maximum distance and use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Avoid inhaling hazardous vapours and fumes from burning materials. Keep upwind.

Remove container from fire area if possible and without risk. Water can be used to cool unaffected containers but must be contained for later disposal.

Dyke fire control water for later disposal. Do not scatter the material. Avoid pollution of waterways.

Do not use high volume water jet, due to contamination risk. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

**Personal protective equipment:**

Fire may produce irritating or poisonous vapours or gases or other products of combustion. Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

## SECTION 6 - ACCIDENTAL RELEASE MEASURES (SPILLAGE)

**Personal precautions:**

Avoid contact with skin and eyes. Do not breathe in fumes. For personal protection see Section 8.

**Environmental precautions:**

Difenoconazole is very toxic to fish and is regarded as an environmentally hazardous substance.

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.

**Occupational spill:**

Do not touch spilled material; stop leak if you can do it without risk. Keep out unprotected persons and animals.

**For spills:** Soak up with absorptive material such as damp earth or sand or other suitable non-combustible absorbent material. Place the material into a clean, dry container and cover for subsequent disposal. In situations where product comes in contact with water, contain contaminated water for later disposal. Prevent material from spreading by damming in with absorptive material. Do not flush spilled material into drains. Keep spectators away and upwind.

To decontaminate spill area, tools and equipment, wash with a suitable solution (i.e. organic solvent, detergent bleach or caustic). Add the solution to the drums already collected. Label drums with its content and dispose it in accordance with local regulations.

Open burning or dumping of this material is prohibited.

Do not get water inside containers.

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## SECTION 7 - HANDLING AND STORAGE REQUIREMENTS

### Handling:

Harmful if swallowed. Avoid inhalation and contact with eyes and skin. Use with adequate ventilation. Do not handle broken packages without protective equipment. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the product gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Seek medical advice.

Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.

Worker should shower at the end of each work day. Launder all clothing before it is re-used again.

### Storage:

Store in its original container in dry, cool, well-ventilated area. Avoid excess heat. Not to be stored next to foodstuffs and water supplies.

Keep out of reach of children, uninformed persons and animals. Do not contaminate other pesticides and fertilizers.

### Storage stability:

Stable for a period of 2 years under normal warehouse conditions.

## SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

It is essential to provide adequate ventilation. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire, and other applicable regulations.

### PERSONAL PROTECTIVE EQUIPMENT:

#### Respirator:

An approved full-face respirator suitable for protection from spray or mists of pesticides is required. Limitations of respirator use specified by the approved agency and the manufacturer must be observed.

#### Clothing:

Employee must wear appropriate protective (impervious) clothing, boots, hat and equipment to prevent repeated or prolonged skin contact with this substance. Do not wear leather clothing.

#### Gloves:

Employee must wear appropriate chemical resistant protective gloves to prevent contact with this substance.

#### Eye protection:

The use of chemical resistant goggles or face shield.

**Emergency eye wash:** Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

Comply with occupational safety, environmental, fire, and other applicable regulations.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Yellow to amber homogenous liquid.
<b>Odour:</b>	Aromatic hydrocarbon odour.
<b>Relative density:</b>	0,992 ± 0,05
<b>Solubility in water:</b>	Forms an emulsion in water.
<b>Flash point:</b>	60 °C
<b>Flammability:</b>	Combustible.
<b>pH:</b>	5.2

## SECTION 10 - STABILITY AND REACTIVITY

### Stability:

Considered stable for a period of 2 years under recommended warehouse and light conditions.

### Hazardous decomposition:

Emits toxic and irritant vapours under fire conditions.

## SECTION 11 - TOXICOLOGICAL INFORMATION

**Acute oral LD<sub>50</sub>:** *Technical: 1453 mg/kg in rats.*

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<b>Acute dermal LD<sub>50</sub>:</b>	Formulation calculated: > 2800 mg/kg Technical: > 2010 mg/kg in rabbits.
<b>Acute inhalation LC<sub>50</sub>:</b>	Formulation calculated: > 4000 mg/kg Technical: ≥ 3300 mg/ℓ air (4 hours)
<b>Acute skin irritation:</b>	Formulation calculated: Harmful. May cause moderate irritation.
<b>Acute eye irritation:</b>	May cause moderate irritation.
<b>Skin sensitization:</b>	Not likely to be a skin sensitizer.
<b>Reproductive effects:</b>	

The results of the 2-generation reproductive and developmental toxicity studies do not demonstrate increased sensitivity of infants and children to difenoconazole.

**Teratogenic effects:**

Difenoconazole is not teratogenic.

**Mutagenic effects:**

Difenoconazole is not mutagenic.

**Carcinogenic effects:**

The EPA previously classified difenoconazole as a possible human carcinogen. This chemical would now be classified as a likely human carcinogen in accordance with the Agency's "Proposed Guidelines for Carcinogenic Risk Assessment"

**Neurotoxic effects:**

Neurotoxicity studies are not applicable because difenoconazole is not a cholinesterase inhibitor and there is no evidence in the available data base that difenoconazole possesses neurotoxic properties.

**ADI:** 0.01 mg/kg b.w.

## SECTION 12 - ECOLOGICAL INFORMATION

**Degradation:**

Difenoconazole is practically immobile in soil and is strongly adsorbed to soil particles (mean adsorption coefficient normalised to organic carbon,  $K_{oc,ads}$  3759 ml/g). It has a low potential to leach below top soil layer. Soil dissipation rate is slow and dependent on application rate.

DT<sub>50</sub> is 50 to 150 days.

DT<sub>50</sub> from water is 2 days.

In plants two routes of metabolism are applicable. One is by a triazole route to triazolylalanine and triazolylacetic acid; the other is by hydroxylation of the phenyl ring, followed by conjugation.

**ECOTOXICOLOGY:**

**Birds:** Slightly to practically non-toxic to birds.

LD <sub>50</sub> (9 to 11 days):	Bobwhite quail:	> 2150 mg/kg
	Japanese quail:	> 2000 mg/kg
LC <sub>50</sub> :	Bobwhite quail:	4760 ppm
	Mallard ducks:	> 5000 ppm

**Fish:** Very toxic to fish.

LC <sub>50</sub> (96 hours):	Bluegill sunfish:	1.2 mg/ℓ
	Rainbow trout:	0.81 mg/ℓ
	Sheepshead minnows:	0.82 mg/ℓ

**Daphnia:** Very toxic to Daphnia.

48-hour LC<sub>50</sub>: *Daphnia magna*: 0.77 mg/ℓ

**Algae:** Very toxic to algae.

EC<sub>50</sub>: *Scenedesmus subspicatus*: 0.032 – 1.2 mg/ℓ

**Other aquatic species:** Very toxic.

LC <sub>50</sub> (96 hours):	Mysid shrimps:	0.15 mg/ℓ
EC <sub>50</sub> (96 hours):	Eastern oysters:	0.45 mg/ℓ
EC <sub>50</sub> (14 days):	Duckweed ( <i>Lemna gibba</i> ):	18.5 mg/ℓ

**Bees:** Not toxic to bees.

LD <sub>50</sub> (oral):	> 187 µg/bee
LD <sub>50</sub> (contact):	> 100 µg/bee

**Earthworms:** LC<sub>50</sub>: > 610 mg/kg

Use under field conditions is not expected to result in adverse effects on soil micro-organisms or on soil- and foliar-dwelling non-target arthropods.

**Product is considered a MARINE POLLUTANT.**

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## SECTION 13 - DISPOSAL CONSIDERATION

### Pesticide disposal:

Open dumping or burning of this pesticide is prohibited. Waste resulting from the use of this product cannot be reused or reprocessed. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Do not contaminate rivers, dams or any other water sources with the product or used containers.

Comply with local legislation applying to waste disposal.

### Container disposal:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed.

TRIPLE RINSE empty containers in the following manner: Invert the empty container over the spray or mixing tank and allow to drain for at least 30 seconds after the flow has slowed down to a drip. Thereafter rinse the container three times with a volume of water equal to a minimum of 10 % of that of the container. Add the rinsings to the contents of the spray tank before destroying the container in the prescribed manner.

Do not re-use the empty container for any other purpose but destroy it by perforation and flattening and bury in an approved dump site. Prevent contamination of food, feedstuffs, drinking water and eating utensils.

Comply with local legislation applying to waste disposal.

## SECTION 14 - TRANSPORT INFORMATION

UN No.: 3082

### Road Transport ADR/IRD:

Class: 9

Packing group: III

Shipping name: Environmentally hazardous substance, liquid, N.O.S. (difenoconazole 250 g/l)

### Maritime Transport IMDG/IMO:

Class: 9

Packing group: III

Shipping name: Environmentally hazardous substance, liquid, N.O.S. (difenoconazole 250 g/l)

## SECTION 15 - REGULATORY INFORMATION

Symbol: Xn, N

Indication of danger: Harmful, Environmentally Hazardous Substance

### Risk phrases:

R 7 May cause fire.

R 22 Harmful if swallowed.

R 36/37/38 Irritation to eyes, respiratory system and skin.

R 40 Limited evidence of a carcinogenic effect.

R 50 Very toxic to aquatic organisms.

### Safety phrases:

S 1/2 Keep locked up and out of the reach of children.

S 15 Keep away from heat.

S 24/25 Avoid contact with skin and eyes.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 60 This material and its container must be disposed of as hazardous waste.

## SECTION 16 - OTHER INFORMATION

### Packing and Labelling:

Packed in 1, 5, 10, 20, and 25 litre fluorinated plastic containers and labelled according to the South African regulations and guidelines.

### Disclaimer:

The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of the product nor where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof

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