

SHELF LIFE:

Two years from date of manufacture (see side of container) if stored in a cool, dry place in original, sealed container.

PRECAUTIONS:

1. Handle with care. Avoid splashing/contact. Poisonous by swallowing, inhalation and contact with the skin.
 2. Irritating to eyes and skin and causes sensitisation by skin contact
 3. **WEAR FULL PROTECTIVE CLOTHING** i.e. rubber gloves, rubber boots, overalls, hood and respirator when handling this pesticide.
 4. **DO NOT** eat, drink or smoke while applying this insecticide.
 5. DANGEROUS TO ANIMALS, FISH, BEES AND BIRDS.
 6. Remove protective clothing on completion of spraying and wash hands and face thoroughly with soap and water.
 7. **DO NOT** CONTAMINATE DRINKING POOLS, DAMS, RIVERS AND WATERWAYS.
 8. DANGEROUS TO LIVESTOCK AND DOMESTIC PETS.
 9. KEEP OUT OF REACH OF CHILDREN.
 10. KEEP APART FROM FOOD AND FOODSTUFFS.
 11. Store in original container and KEEP UNDER LOCK AND KEY.
 12. Destroy empty container – DO NOT use for any other purpose.
- #### EMPTY CONTAINER DISPOSAL:
13. 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.
 14. Destroy empty container by perforation and flattening and bury away from water courses.

After accidental skin contact, **DO NOT** start flushing with water. Wipe off with dry cloth or using talcum powder then wash with soap and water and apply fatty oil or cream.

VANTEX 60 CS

INSECTICIDE

REG No: 17-D-209-1

Contents: 1 Litre



HARMFUL IF SWALLOWED

COMPOSITION: (mass / volume)

gamma-cyhalothrin	60 g / litre
solvents, emulsifiers	940 g / litre

Chemical Group: Synthetic Pyrethroid

Vantex 60 SC is a synthetic pyrethoid insecticide effective against a range of insect pests on cruciferae, dry beans, green beans, groundnuts, macadamia, maize, sweetcorn, lucerne, onions, peas, potatoes, soyabeans, tomatoes, sorghum, sweetcorn and wheat.

TO CAUSE A HAZARD IN THE USE, STORAGE OR DISPOSAL OF THIS SUBSTANCE IS AN OFFENCE

Contents:

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FMC

Cheminova A/S, Thyborønvej 78, DK-7673 Harboøre, www.cheminova.dk

SYMPTOMS OF POISONING:

Gamma-cyhalothrin can cause feelings of burning, tingling or numbness in exposed areas (paraesthesia)

FIRST AID:

General: If any sign of poisoning occurs, call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to a pyrethroid insecticide. Describe his/her condition and the extent of exposure. Immediately remove the exposed person from the area where the product is present.

As soon as a feeling of tingling is noted in any skin area, it is recommended to immediately apply a vitamin E cream. For this purpose vitamin E cream should be available at the workplace.

If in eyes: Immediately rinse eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and rinse again. See physician immediately.

If on skin: Immediately remove contaminated clothing and footwear. **DO NOT** start with flushing with water, but wipe off with dry cloth or using talcum powder, followed by washing with water and soap. Thereafter apply vitamin E cream or fatty skin care oil or cream. See physician if contamination is severe or if feeling unwell.

If swallowed: Let the exposed person rinse mouth and let him/her drink several glasses of water (not milk or cream or other substance containing fats, which may enhance absorption), but **DO NOT** induce vomiting. If vomiting does occur, let him/her rinse mouth and drink fluids again. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Registered by: **Pivotal Agro-Services P/L**
P O Box WGT 450, Westgate, Harare
Telephone 309800 / 25
Manufactured by: **FMC Corporation**



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If inhaled: If experiencing any discomfort, immediately remove from exposure. Light cases: Keep person under surveillance. Get medical attention immediately if symptoms develop. Serious cases: Get medical attention immediately or call for an ambulance. If breathing has stopped, immediately start artificial respiration and maintain until a physician takes charge of the exposed person.

NOTE TO PHYSICIAN:

There is no specific antidote against this substance. Gastric lavage and administration of activated charcoal can be considered. After decontamination, treatment is symptomatic and supportive as indicated. Normally recovery is spontaneous.

WARNINGS:

Withholding periods: Minimum number of days between last application and harvest or feeding/grazing:

Lucerne (grazing)	8 days
Macadamias	14 days
Wheat, soybeans, and sorghum	28 days
Apples, apricots, nectarines, pears, table peaches and plums	14 days
Dry beans, maize and sweetcorn	7 days
Tomatoes, cruciferae and lupins (grazing)	2 days
Canning peaches, potatoes, peas and onions	3 days
Green beans	1 day
Wheat, soybeans, sorghum and maize (grazing)	28 days

***Warning against resistance :**

DO NOT apply more than two applications per growing season. If a pyrethroid gives poor performance **DO NOT** respray with any synthetic pyrethroid, even at a corrective dosage rate. Use a product from a different chemical group.

For resistance management, VANTEX 60 CS is a group code 3A insecticide. Any insect population may contain individuals naturally resistant to VANTEX 60 CS and other group code 3A insecticides. The resistant individuals can eventually dominate the insect population if these insecticides are used repeatedly. These resistant insects may not be controlled by VANTEX 60 CS or any other group code 3A insecticide.

To delay insecticide resistance:

- Avoid exclusive repeated use of insecticides from the same insecticide group code. Alternate or tank-mix with products from different insecticide group codes.
- Integrate the control methods (chemical, cultural, biological) into insect control programmes.

Re-entry interval: DO NOT enter treated field until spray deposit has dried unless wearing protective clothing.

Aerial application: Notify all inhabitants in the immediate vicinity of the area to be treated and issue the necessary warnings. **DO NOT** spray over or allow drift to contaminate water or adjacent areas.

WARRANTY:

Although this remedy has been extensively tested under a large variety of conditions, the registration holder does not warrant that it will be efficacious under all conditions because the action and effect thereof may be affected by factors such as abnormal soil, climatic and storage conditions; quality of dilution water, compatibility with other substances not indicated on the label and the occurrence of resistance of the pest to the remedy concerned as well as by the method, time and accuracy of application. The registration holder furthermore does not accept responsibility for damage to crops, vegetation, the environment or harm to man or animal or for lack of performance of the remedy concerned due to failure of the user to follow the label instructions, or to the occurrence of conditions which could not have been foreseen in terms of the registration. Consult the supplier in the event of any uncertainty.

DIRECTIONS FOR USE: Use only as indicated

Mixing instructions:

Half fill the spray tank with clean water. Measure out the required quantity of VANTEX 60 CS and pre-mix this with at least 10 liters water. Add this to the spray tank while agitating the mixture. Fill the spray tank while maintaining agitation to ensure thorough mixing of the spray mixture before spraying commences. Maintain agitation during the whole spraying operation.

GROUND APPLICATION:

It is necessary to fit equipment with hollow cone nozzles that give medium to fine droplets when using a conventional high volume sprayer. Calibrate the equipment before use and ensure correct application. The spray mixture must be evenly distributed over the target area. All spray applications must be made with suitable equipment that is in good working order and correctly calibrated to give the desired coverage for that particular method of application.

AERIAL APPLICATION:

Aerial application of VANTEX 60 CS may only be done by a registered aerial application operator using a registered and correctly calibrated aircraft according to the instructions of SANS Code 10118 (Aerial Application of Agricultural Pesticides). Ensure that the spray mixture is distributed evenly over the target area and that the loss of spray material during application is restricted to a minimum. It is therefore essential that the following criteria be met;

- Volume: A spray mixture volume of 30 litres per hectare is recommended. As this product has not been evaluated at a reduced volume rate, the registration holder cannot guarantee efficacy, or be held responsible for any adverse effects if this product is applied aerially at a lower volume rate than recommended above.
- Droplet coverage: 30 to 40 droplets per cm² must be recovered at the target area.
- Droplet size: A droplet spectrum with a VMD of 250 to 280 microns is recommended. Limit the production of fine droplets less than 150 microns (high drift and evaporation potential) to a minimum.
- Flying height: Maintain the height of the spray boom at 3 to 4 metres above the target. DO NOT spray when aircraft dives, is in a climb or when banking.
- Use suitable atomizing equipment that will produce the desired droplet size and coverage, but which will ensure the minimum loss of product. The spraying system must produce a droplet spectrum with the lowest possible Relative Span.

- Position all the atomizers within the inner 60 to 75 % of the wingspan to prevent droplets from entering the wingtip vortices.
- The difference in temperature between the wet and dry bulb thermometers, of a whirling hygrometer, should not exceed 8°C. Stop spraying if the wind speed exceeds 15 km/h.
- Stop spraying under turbulent, unstable and dry conditions during the heat of the day.
- Spraying under temperature inversion conditions (spraying in or above the inversion layer) and/or high humidity conditions (relative humidity 80 % and above) may lead to the following:
 - reduced efficacy due to suspension and evaporation of small droplets in the air (inadequate coverage),
 - damage to other sensitive crops and/or non-target areas through drifting of the suspended spray cloud away from the target field.
- Ensure that the Aerial Spray Operator knows exactly which fields to spray.

Obtain an assurance from the Aerial Spray Operator that the above requirements will be met and that relevant data will be compiled in a logbook and kept for future reference.

Prepared spray mixture must not be left in the spray tank for any length of time e.g. overnight. The addition of molasses has an acidifying effect and reduces evaporation of the spray mist. For ground application add 10 % molasses by volume and 20 % for aerial application.

APPLICATION RATES:

CROP	ml / 100l water	Dosage / Ha or as indicated	Remarks
TOMATO Bollworm (<i>Helicoverpa armigera</i>) Semi-looper (<i>Chrysodeixis acuta</i>)	3.5 ml/100 l water		Ground application: Apply as a full cover spray at the first signs of infestation. Repeat the application at 7 - 10 day intervals or as directed by inspection of the crop. Apply 500 - 1 000 L spray mixture / ha. Use lower spray volume of 500 L / ha for plants smaller than 1 m and higher spray volume for taller plants.
POTATO Tuber moth larvae (<i>Phthorimaea operculella</i>) Bollworm (<i>Helicoverpa armigera</i>)		50 ml / ha	Ground application: Apply in 250 – 500 l water / ha depending on plant size. Start spraying when plants are one month old or earlier if an infestation should occur. Apply every 10 - 14 days and ridge at least twice during the growing season.
		55 ml / ha	Aerial application: Apply in at least 30 l water / ha. Start spraying as soon as plants are one month old or earlier if an infestation should occur. Repeat application every 10 – 14 days and ridge at least twice during the growing season. See “Warnings” - warning against resistance.
DRY BEANS, GROUNDNUTS, GREEN BEANS Bollworm (<i>Helicoverpa armigera</i>)		42 ml / ha	Commence application as soon as eggs or larvae are noticed on plants. Repeat the application at 14 day intervals or as directed by inspection of the crop.
		42 ml / ha	Ground application: Apply in 250 – 500 l water / ha depending on plant size. Scout fields at 7 day intervals from time of flowering and start spraying when infestation is noticed. Larvae should not be larger than 1 cm in length for optimum control. Scout field every 7 days or 3 days after rain. Repeat application if necessary.
SOYBEANS Bollworm (<i>Helicoverpa armigera</i>)		50 ml / ha	Aerial application: Apply in 30 l water / ha. See “Warnings” - warning against resistance.
		50 ml / ha	Ground application: Ensure good coverage of the plants by applying in 200 – 300 l water / ha. Start application as soon as an infestation is noticed and repeat as necessary.
			Aerial application: Apply in 30 l water / ha. Start application as soon as infestation is noticed and repeat as necessary. See “Warnings” - warning against resistance.

CROP	ml / 100l water	Dosage / Ha or as indicated	Remarks
PEAS (including MANGE TOUT) Bollworm (<i>Helicoverpa armigera</i>)		42 ml / ha	Ground application: Apply in not less than 200 l water / ha. Start application at flowering when the infestation of bollworm larvae is at 2 bollworms / 20 plants. If a re-infestation occurs, a follow up application may be necessary.
		50 ml / ha	Pivot application: Start application when the infestation of bollworm eggs are at a level of 6 eggs / 24 plants or the larvae at 2 larvae / 24 plants. A correctly calibrated injector on the pivot line must be used. Pivot speed to be at 100 %. See “Warnings” warning against resistance.
CRUCIFERAE Bollworm (<i>Helicoverpa armigera</i>) and Caterpillars of the Diamond back moth (<i>Plutella xylostella</i>)	3,5ml / 100 l water		Ensure good wetting of the plant by adding a wetting agent. Commence spraying at the first signs of the pest and repeat sprays at 10 - 14 day intervals. Apply 500 - 1000 l spray mixture / ha. See “Warnings” - warning against resistance.
MAIZE, SWEETCORN, LUCERNE Bollworm (<i>Helicoverpa armigera</i>) Pink stalk borer (<i>Sesamia calamistis</i>)		42 ml / ha	Ground application: Apply in 250 – 500 l water / ha depending on plant size. Scout fields at 7 day intervals from time of flowering and start spraying when infestation is noticed. Larvae should not be larger than 1 cm in length. Scout every 3 days after rain and spray if necessary. See “Warnings” - Warning against resistance.
		0.4 ml / 100 m row	Ground application: Sweetcorn: Apply directly into funnel. Start spraying 2 weeks after planting and repeat at 10 - 14 day intervals until the ears appear. Use in not less than 3 l water / 100 m row.

CROP	ml / 100l water	Dosage / Ha or as indicated	Remarks
MAIZE Maize stalk borer (<i>Busseola fusca</i>) (First and second generation) Chilo stalk borer (<i>Chilo partellus</i>) Fall Armyworm (<i>Spodoptera frugiperda</i>)		0.5 ml / 100 m row Or 50 ml / ha 50 ml / ha 0.5 ml / 100 m row	Treat before larvae enter stalks. Apply up to the stage when tassels are enclosed by the flag leaf. Ground application: The first application must be made when 10 % of the plants show shot-hole damage. Apply in 3 l water / 100 m row. The spray must be directed into the funnel. When larvae are longer than 10 mm or a re-infestation occurs a second application may be necessary within 10 - 12 days after the first application. Aerial application: Apply in 30 l water / ha as an early corrective application when 10 % of the plants show shot-hole damage. When larvae are longer than 10 mm or a re-infestation occurs a second application may be necessary within 10 - 12 days after the first application. Ground application: See remarks for stalk borer control above.
ONIONS Thrips (<i>Thrips tabaci</i>)		33 – 50 ml / ha	Start applying when the first signs of damage are noticed on the leaves. Apply in a spray programme every 10 - 14 days. The lower dosage rate can be used if thrip counts are below 0,6 thrips per plant (6 per 10 plants). Follow up applications with higher dosage rate 10 - 14 days later. DO NOT use on spring onions.
SORGHUM American (African) bollworm (<i>Helicoverpa armigera</i>) Stalk borer (<i>Busseola fusca</i>)		42 ml / ha 42 ml / ha 0.4 ml / 100 m row 42 ml / ha	Ground application: Direct application onto ears. Apply in 300 – 500l water / ha. Start application as soon as infestation is present. Follow up if necessary. Aerial application: Apply in 30 l water / ha. Apply when pest is noticed. If bollworm are concealed in the ear, control may be less effective. Later infestations may require a second application. See "Warnings" - warning against resistance. Ground application: Apply in funnel when 5 % of plants show shot-hole damage and larvae have not yet entered stalks. Apply in 3 l water/100 m and direct spray into the funnel. Will also control <i>Chilo partellus</i> if present at time of application. Aerial application: Apply in 30 l water / ha.

CROP	ml / 100l water	Dosage / Ha or as indicated	Remarks
ALL CROPS Cutworm (<i>Agrotis spp.</i>)		0.1 ml / 100 m row 30 ml / ha 30 ml / ha 0.1 ml / 100 m row 30 ml / ha	Soil must be well-prepared - free of clods and excessive plant debris. Apply pre- or post-emergence. Apply ONLY if the top 3 cm of soil is moist. Where high cutworm populations is expected (minimum tillage), monitor infestations for follow-up applications. Preventive application (pre-emergence): Ground application: Row treatment: Apply in at least 3 l water / 100 m in a 30 cm wide band over row. Overall application: Apply in 300 l water/ha. Aerial application: Apply in 30 l water / ha. Corrective application (post-emergence): Ground application: Row treatment: Apply in at least 3 l water / 100 m in a 30 cm wide band over the row. Overall application: Apply in 300l water/ ha. Aerial application: Apply in 30 l water / ha.
MACADAMIA Stink bug (<i>Nezara viridula</i>)	4,2 ml / 100 l water		Apply as high volume full cover spray. Application timing is based on stinkbug numbers. Scouting for stinkbug is done according to the tree shake method. Start monitoring stinkbug numbers two weeks after flowering. Apply when average of 1.8 stinkbugs are counted per tree (18 per 10 trees). Two to three applications may be necessary per season.
WHEAT American (African) bollworm (<i>Helicoverpa armigera</i>)		42 ml / ha	Apply as a full cover spray as soon as pest appears and ensure adequate wetting of ears. Repeat after 10 - 14 days depending on level of infestation. Ground and aerial application in 250 – 500 l and 30 l water / ha respectively. See warn ing against resistance under "Warnings" above.

**FOR FURTHER INFORMATION ON THIS PRODUCT,
TELEPHONE HARARE 04 - 309825**

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Product name	1526, GAMMA-CYHALOTHRIN 60 g/l CS	April 2017
Safety data sheet according to EU Reg. 1907/2006 as amended		Supersedes July 2015

SAFETY DATA SHEET

1526, GAMMA-CYHALOTHRIN 60 g/l CS

Revision: Sections containing a revision or new information are marked with a ♣.

♣ SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

- 1.1. **Product identifier** **1526, Gamma-cyhalothrin 60 g/l CS**
Contains gamma-cyhalothrin and 1,2-benzisothiazol-3(2H)-one
- 1.2. **Relevant identified uses of the substance or mixture and uses advised against** Can be used as insecticide only.
- 1.3. **Details of the supplier of the safety data sheet** **CHEMINOVA A/S**, a subsidiary of FMC Corporation
 Thyborønvej 78
 DK-7673 Harboøre
 Denmark
SDS.Ronland@fmc.com
- 1.4. **Emergency telephone number**
Company (+45) 97 83 53 53 (24 h; for emergencies only)
- Medical emergencies:
- | | |
|-------------------------------------|---|
| Austria: +43 1 406 43 43 | Norway: +47 22 591300 |
| Belgium: +32 70 245 245 | Poland: +48 22 619 66 54 |
| Bulgaria: +359 2 9154 409 | +48 22 619 08 97 |
| Czech Republic: +420 224 919 293 | Portugal: 808 250 143 (in Portugal only) |
| +420 224 915 402 | +351 21 330 3284 |
| Denmark: +45 82 12 12 12 | Romania: +40 21318 3606 |
| France: +33 (0) 1 45 42 59 59 | Slovakia: +421 2 54 77 4 166 |
| Finland: +358 9 471 977 | Slovenia: +386 41 650 500 |
| Hungary: +36 80 20 11 99 | Spain: +34 91 562 04 20 |
| Ireland (Republic): +352 1 809 2166 | Sweden: +46 08-331231 |
| Italy: +39 02 6610 1029 | 112 |
| Lithuania: +370 523 62052 | Switzerland: 145 |
| +370 687 53378 | United Kingdom: 0870 600 6266 (in the UK only) |
| Luxembourg: +352 8002 5500 | U.S.A. & Canada: +1 800 / 331-3148 (PROSAR) |
| Netherlands: +31 30 274 88 88 | All other countries: +1 651 / 632-6793 (PROSAR - Collect) |

SECTION 2: HAZARDS IDENTIFICATION

- 2.1. **Classification of the substance or mixture** Sensitisation – skin: Category 1 (H317)
 Specific target organ toxicity – repeated exposure: Category 2 (H373)

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Hazards to the aquatic environment, acute: Category 1 (H400)
 chronic: Category 1 (H410)

WHO classification Class III: Slightly hazardous

Health hazards The product may cause hypersensitivity by skin contact in certain individuals. Chronic exposure may cause functional changes in the central and peripheral nervous systems (see section 11).

Gamma-cyhalothrin is very toxic by inhalation and toxic if swallowed. In this formulation it is present in microencapsulated form, which will lower its toxicity, but inhalation of spray or mist must be avoided.

Environmental hazards The product is very toxic to aquatic organisms.

2.2. Label elements

According to EU Reg. 1272/2008 as amended

Product identifier 1526, Gamma-cyhalothrin 60 g/l CS
 Contains gamma-cyhalothrin and 1,2-benzisothiazol-3(2H)-one

Hazard pictograms (GHS07, GHS08, GHS09)



Signal word Warning

Hazard statements

H317 May cause an allergic skin reaction.

H373 May cause damage to nervous system through prolonged or repeated exposure.

H410 Very toxic to aquatic life with long lasting effects.

Supplementary hazard statement

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

Precautionary statements

P261 Avoid breathing vapours.

P280 Wear protective gloves.

P314 Get medical attention/advice if you feel unwell.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

P501 Dispose of contents/container as hazardous waste.

2.3. Other hazards None of the ingredients in the product meets the criteria for being PBT or vPvB.

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

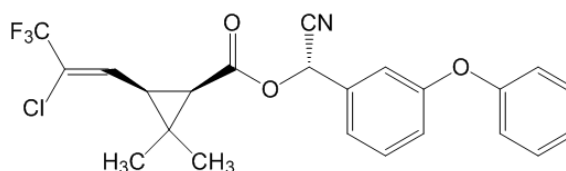
- 3.1. **Substances** The product is a mixture, not a substance.
- 3.2. **Mixtures** See section 16 for full text of hazard statements.

The product is a suspension in water of porous microcapsules containing the active ingredient gamma-cyhalothrin.

Active ingredient

Gamma-cyhalothrin	Content: 6% by weight
CAS name	Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl, cyano(3-phenoxyphenyl)methyl ester, [1R-[1 α (S*),3 α (Z)]]-
CAS no.	76703-62-3
IUPAC name	(S)- α -Cyano-3-phenoxybenzyl (Z)-(1R,3R)-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate
ISO name/EU name	Gamma-cyhalothrin
EC no. (EINECS no.)	None
EU index no.	None
Classification of the ingredient	Acute oral toxicity: Category 3 (H301) Acute dermal toxicity: Category 4 (H312) Acute inhalation toxicity: Category 1 (H330) Sensitisation – skin: Category 1A (H317) STOT – repeated exposure: Category 1 (H372) Hazards to the aquatic environment, acute: Category 1 (H400) chronic: Category 1 (H410)

Structural formula



Reportable ingredients

	Content (% w/w)	CAS no.	EC no.	Classification
Hydrocarbons, C10-C13, aromatics, < 1% naphthalene Reg. no. 01-2119451097-39	5		922-153-0	Asp. Tox. 1 (H304) Aquatic Chronic 2 (H411)
1,2-Benzisothiazol-3(2H)-one	max. 0.03	2634-33-5	EINECS no.: 220-120-9	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Skin Sens. 1A (H317) Aquatic Acute 1 (H400)

SECTION 4: FIRST AID MEASURES

- 4.1. **Description of first aid measures** If exposure has occurred, do not wait for symptoms to develop, but immediately start the procedures described below.

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Inhalation	<p>If experiencing any discomfort, immediately remove from exposure. Light cases: Keep person under surveillance. Get medical attention immediately if symptoms develop. Serious cases: Get medical attention immediately or call for an ambulance.</p> <p>If breathing has stopped, immediately start artificial respiration and maintain until a physician takes charge of the exposed person.</p>
Skin contact	<p>Immediately remove contaminated clothing and footwear. Do not start with flushing with water, but wipe off with dry cloth or using talcum powder, followed by washing with water and soap. Thereafter apply lidocaine, vitamin E cream, fatty skin care oil or cream. See physician if contamination is severe or if feeling unwell.</p>
Eye contact	<p>Immediately rinse eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and rinse again. See physician immediately.</p>
Ingestion	<p>Let the exposed person rinse mouth with water and let him/her drink 1 or 2 glasses of water (not milk or cream or other substance containing fats, which may enhance absorption), but not induce vomiting. If vomiting does occur, let him/her rinse mouth and drink water again. Never give anything by mouth to an unconscious person. Get medical attention immediately.</p>
4.2. Most important symptoms and effects, both acute and delayed	<p>Gamma-cyhalothrin can cause feelings of burning, tingling or numbness in exposed areas (paraesthesia).</p>
4.3. Indication of any immediate medical attention and special treatment needed	<p>If any sign of poisoning occurs, call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to a pyrethroid insecticide. Describe his/her condition and the extent of exposure. Immediately remove the exposed person from the area where the product is present.</p> <p>As soon as a feeling of tingling is noted in any skin area (see section 11), it is recommended to immediately apply lidocaine or a vitamin E cream. For this purpose lidocaine or vitamin E cream should be available at the workplace.</p> <p>It may be helpful to show this safety data sheet to physician.</p>
Notes to physician	<p>A specific antidote against this substance is not known. Gastric lavage and administration of activated charcoal can be considered. After decontamination, treatment is symptomatic and supportive as indicated. Normally recovery is spontaneous.</p> <p>If allowed to penetrate the skin, gamma-cyhalothrin may cause an irritation similar to sunburn. The substance will be drawn into a non-polar environment such as a fat based oil or cream. Vitamin E cream has been reported to be beneficial. Water is highly polar and will not</p>

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decrease, but may prolong the irritation. Hot water may increase the pain.

For eye contamination, instillation of local anaesthetic can be considered.

SECTION 5: FIRE-FIGHTING MEASURES

- 5.1. **Extinguishing media** Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.
- 5.2. **Special hazards arising from the substance or mixture** The essential breakdown products are volatile, toxic, irritant and inflammable compounds such as nitrogen oxides, hydrogen chloride, hydrogen fluoride, carbon monoxide, carbon dioxide and various chlorinated and fluorinated organic compounds. Traces of hydrogen cyanide may be present.
- 5.3. **Advice for firefighters** Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1. **Personal precautions, protective equipment and emergency procedures** It is recommended to have a plan for the avoidance of spills. If spillage does occur, it has to be removed and the area cleaned immediately according to a predetermined plan. It is recommended to clean area or equipment also if contamination is suspected.
- Empty, sealable vessels for the collection of spills should be available.
- In case of large spill (involving 10 tonnes of the product or more):
1. use personal protection equipment; see section 8
 2. call emergency telephone no.; see section 1
 3. alert authorities.
- Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and rubber boots.
- Stop the source of the spill immediately if safe to do so. Keep unprotected persons away from the spill area. Avoid and reduce formation of vapour or mist as much as possible.
- 6.2. **Environmental precautions** Contain the spill to prevent any further contamination of surface, soil or water. Wash waters must be prevented from entering surface water drains. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

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6.3. Methods and materials for containment and cleaning up

It is recommended to consider possibilities to prevent damaging effects of spills, such as bunding or capping. See GHS (Annex 4, Section 6).

If appropriate, surface water drains should be covered. Minor spills on the floor or other impervious surface should be absorbed onto an absorptive material such as universal binder, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Clean area with detergent and much water. Absorb wash liquid with absorbent and transfer to suitable containers. The used containers should be properly closed and labelled.

Large spills which soak into the ground should be dug up and transferred to suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal.

Area or equipment can be cleaned with water/isopropanol mixture (25/75) under alkaline conditions (pH > 12). Personal protection equipment must also be used when cleaning.

6.4. Reference to other sections

See subsection 8.2. for personal protection.
 See section 13 for disposal.

♣ SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

In an industrial environment it is important to avoid all personal contact with the product, if possible by using closed systems with remote system control. The material should be handled by mechanical means as much as possible. Adequate ventilation or local exhaust ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.

For its use as a pesticide, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8.

Keep all unprotected persons and children away from working area.

Remove contaminated clothing immediately. Wash thoroughly after handling. Before removing gloves, wash them with water and soap. After work, take off all work clothes and footwear. Take a shower, using water and soap. Wear only clean clothes when leaving job. Wash protective clothing and protective equipment with water and soap after each use.

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The work area should always be kept clean. Used personal protection equipment should either be thrown out or be cleaned immediately after use. Respirator should be cleaned and filter replaced according to instructions provided with respirator.

Do not discharge to the environment. Do not contaminate water when disposing of equipment wash waters. Collect all waste material and remains from cleaning equipment, etc., and dispose of as hazardous waste. See section 13 for disposal.

7.2. Conditions for safe storage, including any incompatibilities

The product is stable under normal conditions of warehouse storage. Protect against extremes of heat and cold. The product should not be allowed to dry out.

Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorised persons or children. A warning sign reading "POISON" is recommended. The room should only be used for storage of chemicals. Food, drink, feed and seed should not be present. A hand wash station should be available.

Storage of mixtures of the product with other products can increase toxicity because of extraction of the active ingredient from the capsules.

7.3. Specific end use(s)

The product is a registered pesticide which may only be used for the applications it is registered for, in accordance with a label approved by the regulatory authorities.

♣ SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Personal exposure limits

To our knowledge, no exposure limits have been established for gamma-cyhalothrin. An internal value of 0.02 mg/m³ (8-hr LTEL-TWA) is recommended by the manufacturer.

However, other personal exposure limits defined by local regulations may exist and must be observed.

Gamma-cyhalothrin

DNEL, systemic

0.034 mg/kg bw/dag

PNEC, aquatic environment

0.044 ng/l

8.2. Exposure controls

When used in a closed system, personal protection equipment will not be required. The following is meant for other situations, when the use of a closed system is not possible, or when it is necessary to open the system. Consider the need to render equipment or piping systems non-hazardous before opening.

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The precautions mentioned below are primarily meant for handling of the undiluted product and for preparing the spray solution, but can be recommended for spraying as well.

In cases of incidental high exposure, maximal personal protection may be necessary, such as respirator, face mask, chemical resistant coveralls.



Respiratory protection

The product does not automatically present an airborne exposure concern during normal handling. In the event of an accidental discharge of the material which produces a heavy vapour or mist, workers must put on officially approved respiratory protection equipment with a universal filter type including particle filter.



Protective gloves

Wear long chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber. The breakthrough times of these materials for the product are unknown. Generally, however, the use of protective gloves will give only partial protection against dermal exposure. Small tears in the gloves and cross-contamination can easily occur. It is recommended to limit the work to be done manually and to change the gloves immediately if there is a suspicion of contamination. Be careful not to touch anything with contaminated gloves. Used gloves should be thrown out and not be reused. Wash hands with water and soap immediately after work is finished.



Eye protection

Wear face shield rather than goggles or safety glasses. The possibility of eye contact should be excluded.



Other skin protection

Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls of polyethylene (PE) will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of excessive or prolonged exposure, coveralls of barrier laminate may be required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on physical and chemical properties

Appearance	Opaque off-white liquid
Odour	Oily
Odour threshold	Not determined
pH	1% solution in water: 5.71 at 23°C
Melting point/freezing point	Below 0°C
Initial boiling point and boiling range	Decomposes
Flash point	> 100°C (Setaflash closed cup)
Evaporation rate	Not determined

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Flammability (solid/gas)	Not applicable (liquid)
Upper/lower flammability or explosive limits	Not determined
Vapour pressure	Gamma-cyhalothrin : 1.03 x 10 ⁻⁷ Pa at 20°C 3.45 x 10 ⁻⁷ Pa at 25°C
Vapour density	Not determined
Relative density	Not determined
Solubility(ies)	Density: 1.019 g/ml at 20°C Solubility of gamma-cyhalothrin at 19°C in: ethyl acetate > 500 g/l heptane 30.7 g/l water 0.0021 mg/l at 20°C Some solvents favour the extraction of the active ingredient from the capsules.
Partition coefficient n-octanol/water	Gamma-cyhalothrin : log K _{ow} = 5.2 at 25°C
Autoignition temperature	None below 400°C
Decomposition temperature	Not determined
Viscosity	The product has high viscosity. It is a non-newtonian fluid; viscosity decreases with increasing shear rate. Shear rate 0.01 s ⁻¹ : > 1 x 10 ⁴ mPa.s Shear rate 100 s ⁻¹ : 45 - 130 mPa.s
Explosive properties.....	Not explosive
Oxidising properties	Not oxidising
9.2. Other information	
Miscibility	The product is dispersible in water.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity	To our knowledge, the product has no special reactivities.
10.2. Chemical stability	Gamma-cyhalothrin decomposes on heating. Direct local heating such as electric heating or by steam must be avoided.
10.3. Possibility of hazardous reactions	None known.
10.4. Conditions to avoid	Heating of the product will evolve harmful and irritant vapours.
10.5. Incompatible materials	None known.
10.6. Hazardous decomposition products	See subsection 5.2.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects	* = Based on available data, the classification criteria are not met.
<i>Product</i>	
Acute toxicity	The product is not considered as harmful. * The acute toxicity as measured on a similar product is:
Route(s) of entry - ingestion	LD ₅₀ , oral, rat (male): 4444 mg/kg (method OECD 401)

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	LD ₅₀ , oral, rat (female): 3257 mg/kg
- skin	LD ₅₀ , dermal, rat: > 5000 mg/kg (method OECD 402)
- inhalation	LC ₅₀ , inhalation, rat: > 2.31 mg/l/4 h (method OECD 403)
Skin corrosion/irritation	Slightly irritating to skin (measured on a similar product, method OECD 404). *
Serious eye damage/irritation	Mildly to moderately irritating to eyes (measured on a similar product, method OECD 405). *
Respiratory or skin sensitisation ...	Sensitising (measured on a similar product; method OECD 406).
Germ cell mutagenicity	The product contains no ingredients known to be mutagenic. *
Carcinogenicity	The product contains no ingredients known to be carcinogenic. *
Reproductive toxicity	The product contains no ingredients known to have adverse effects on reproduction. *
STOT – single exposure	To our knowledge, no specific effects have been observed after single exposure. *
STOT – repeated exposure	The following has been measured on the active ingredient gamma-cyhalothrin: Target organ: nervous system. Repeated exposure may cause neurotoxic effects. Changes of behaviour were seen in animal tests at exposure levels of 6 - 8 mg/kg bw/day (method OECD 408).
Aspiration hazard	The product does not present an aspiration pneumonia hazard. *
Symptoms and effects, acute and delayed	On contact, gamma-cyhalothrin can cause feelings of burning, tingling or numbness in exposed areas (paraesthesia), which is harmless at low exposure, but can be quite painful, especially in the eye. The effect may result from splash, aerosol or transfer from contaminated gloves. The effect is transient, lasting up to 24 hours, but may in exceptional cases last longer. It may be considered as a warning that overexposure has occurred and that work practice should be reviewed.
<u><i>Gamma-cyhalothrin</i></u> Toxicokinetics, metabolism and distribution	Gamma-cyhalothrin is rapidly absorbed following ingestion. It is extensively metabolised. An elimination half-life of 23 days is reported from animal tests. Accumulation in fat is possible.
Acute toxicity	Gamma-cyhalothrin is very toxic by inhalation and toxic if swallowed. Toxicity by skin contact is less severe. The acute toxicity is measured as:
Route(s) of entry - ingestion	LD ₅₀ , oral, rat (male): > 50 mg/kg (method OECD 401)

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	LD ₅₀ , oral, rat (female): approx. 55 mg/kg
- skin	LD ₅₀ , dermal, rat (female): approx. 1650 mg/kg (method OECD 402)
- inhalation	LC ₅₀ , inhalation, rat (female): 0.03 mg/l/4 h (method OECD 403)
Skin corrosion/irritation	Mildly irritating to skin (method OECD 404). *
Serious eye damage/irritation	Not irritating to eyes (method OECD 405). *
Respiratory or skin sensitisation ...	Weakly sensitising (method OECD 406).

Hydrocarbons, C10-C13, aromatics, < 1% naphthalene

Acute toxicity	The substance is not considered as harmful. * The acute toxicity as measured on a similar product is:	
Route(s) of entry	- ingestion	LD ₅₀ , oral, rat: > 5000 mg/kg (method OECD 401)
	- skin	LD ₅₀ , dermal, rat: > 2000 mg/kg (method OECD 402)
	- inhalation	LC ₅₀ , inhalation, rat: > 4.7 mg/l (method OECD 403)
Skin corrosion/irritation	Can cause skin dryness (measured on similar products; method OECD 404).	
Serious eye damage/irritation	May cause mild, short-lasting discomfort to eyes (measured on similar products; method OECD 405). *	
Respiratory or skin sensitisation ...	Not expected to cause respiratory or skin sensitisation (measured on similar products; method OECD 406). *	
Aspiration hazard	Aromatic hydrocarbons present an aspiration hazard.	

1,2-Benzisothiazol-3(2H)-one

Acute toxicity	The substance is harmful by ingestion.	
Route(s) of entry	- ingestion	LD ₅₀ , oral, rat (male): 670 mg/kg
		LD ₅₀ , oral, rat (female): 784 mg/kg (method OPPTS 870.1100, measured on 73% solution)
	- skin	LD ₅₀ , dermal, rat: > 2000 mg/kg * (method OPPTS 870.1200, measured on 73% solution)
	- inhalation	LC ₅₀ , inhalation, rat: not available
Skin corrosion/irritation	Slightly irritating to skin (method OPPTS 870.2500).	
Serious eye damage/irritation	Severely irritating to eyes (method OPPTS 870.2400).	
Respiratory or skin sensitisation ...	Moderate dermal sensitizer to guinea pigs (method OPPTS 870.2600). The substance appears to be significantly more sensitising to humans.	

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SECTION 12: ECOLOGICAL INFORMATION

- 12.1. **Toxicity** The product is very toxic to fish, aquatic invertebrates and insects. It is not considered as harmful to aquatic plants, soil micro- and macroorganisms and birds.

The ecotoxicity of the product is measured as:

- Fish Golden orfe (*Leuciscus idus*) 96-h LC₅₀: 21 - 38 µg/l
- Invertebrates Daphnids (*Daphnia magna* Straus) 48-h LC₅₀: 83.6 µg/l

- 12.2. **Persistence and degradability** **Gamma-cyhalothrin** is not readily biodegradable. Its primary half-life in soil is measured to be 4 - 8 weeks depending on circumstances. It is not toxic to microorganisms in waste water treatment plants, but it is degraded only slowly.

The product contains minor amounts of not readily biodegradable components, which may not be degradable in waste water treatment plants.

- 12.3. **Bioaccumulative potential** See section 9 for octanol-water partition coefficient.

Gamma-cyhalothrin has the potential to bioaccumulate if continuous exposure is maintained. It is excreted within a few weeks.

- 12.4. **Mobility in soil** **Gamma-cyhalothrin** is not mobile in soil.

- 12.5. **Results of PBT and vPvB assessment** None of the ingredients meets the criteria for being PBT or vPvB.

- 12.6. **Other adverse effects** Other relevant hazardous effects in the environment are not known.

SECTION 13: DISPOSAL CONSIDERATIONS

- 13.1. **Waste treatment methods** Remaining quantities of the material and empty but unclean packaging should be regarded as hazardous waste.

Disposal of waste and packaging must always be in accordance with all applicable local regulations.

Disposal of product According to the Waste Framework Directive (2008/98/EC), possibilities for reuse or reprocessing should first be considered. If this is not feasible, the material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Disposal of packaging It is recommended to consider possible ways of disposal in the

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following order:

1. Reuse or recycling should first be considered. If offered for recycling, containers must be emptied and triply rinsed (or equivalent). Do not discharge rinsing water to sewer systems.
2. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.
3. Delivery of the packaging to a licensed service for disposal of hazardous waste.
4. Disposal in a landfill or burning in open air should only occur as a last resort. For disposal in a landfill containers should be emptied completely, rinsed and punctured to make them unusable for other purposes. If burned, stay out of smoke.

♣ SECTION 14: TRANSPORT INFORMATION

ADR/RID/IMDG/IATA/ICAO classification

- 14.1. **UN number** 3082
- 14.2. **UN proper shipping name** Environmentally hazardous substance, liquid, n.o.s. (microencapsulated gamma-cyhalothrin)
- 14.3. **Transport hazard class(es)** 9
- 14.4. **Packing group** III
- 14.5. **Environmental hazards** Marine pollutant
- 14.6. **Special precautions for user** Avoid any unnecessary contact with the product. Misuse can result in damage to health. Do not discharge to the environment.
- 14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code** The product is not transported in bulk by ship.

SECTION 15: REGULATORY INFORMATION

- 15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture** Seveso category (Dir. 2012/18/EU): dangerous for the environment
 Young people under the age of 18 are not allowed to work with the substance.
 All ingredients are covered by EU chemical legislation.
- 15.2. **Chemical safety assessment** A chemical safety assessment is not required to be included for this product.

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♣ SECTION 16: OTHER INFORMATION

Relevant changes in the safety data sheet	Minor corrections only.
List of abbreviations	<p>CAS Chemical Abstracts Service</p> <p>CS Capsule Suspension</p> <p>Dir. Directive</p> <p>DNEL Derived No Effect Level</p> <p>EINECS European INventory of Existing Commercial Chemical Substances</p> <p>GHS Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013</p> <p>IBC International Bulk Chemical code</p> <p>ISO International Organisation for Standardization</p> <p>IUPAC International Union of Pure and Applied Chemistry</p> <p>LC₅₀ 50% Lethal Concentration</p> <p>LD₅₀ 50% Lethal Dose</p> <p>MARPOL Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution</p> <p>n.o.s. Not otherwise specified</p> <p>OECD Organisation for Economic Cooperation and Development</p> <p>OPPTS Office of Prevention, Pesticides & Toxic Substances</p> <p>PBT Persistent, Bioaccumulative, Toxic</p> <p>PNEC Predicted No Effect Concentration</p> <p>Reg. Registration, or Regulation</p> <p>STOT Specific Target Organ Toxicity</p> <p>vPvB very Persistent, very Bioaccumulative</p> <p>WHO World Health Organisation</p>
References	Data measured on this and a similar product are unpublished company data. Data on ingredients are available from published literature and can be found several places.
Method for classification	<p>Sensitisation – skin: read-across</p> <p>Specific target organ toxicity – repeated exposure: calculation rules</p> <p>Hazards to the aquatic environment: test data</p>
Used hazard statements	<p>H301 Toxic if swallowed.</p> <p>H302 Harmful if swallowed.</p> <p>H304 May be fatal if swallowed and enters airways.</p> <p>H312 Harmful in contact with skin.</p> <p>H315 Causes skin irritation.</p> <p>H317 May cause an allergic skin reaction.</p> <p>H318 Causes serious eye damage.</p> <p>H330 Fatal if inhaled.</p> <p>H372 Causes damage to nervous system through prolonged or repeated exposure.</p> <p>H373 May cause damage to nervous system through prolonged</p>



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- or repeated exposure.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.
- H411 Toxic to aquatic life with long lasting effects.
- EUH401 To avoid risks to human health and the environment, comply with the instructions of use.

Advice on training This material should only be used by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product vary and situations unforeseen by Cheminova A/S may exist. The user has to check the validity of the information under local circumstances.

Prepared by: Cheminova A/S / GHB