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CVR No. DK 12 76 00 43

SAFETY DATA SHEET

CHLORPYRIFOS 300 g/l + GAMMA-CYHALOTHRIN 10 g/l EC

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** ..... **Chlorpyrifos 300 g/l + Gamma-cyhalothrin 10 g/l EC**
Contains: chlorpyrifos, gamma-cyhalothrin and hydrocarbons, C9, aromatics

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
Belgium: +32 70 245 245
Bulgaria: +359 2 9154 409
Cyprus: 1401
Czech Republic: +420 224 919 293
+420 224 915 402
Denmark: +45 82 12 12 12
France: +33 (0) 1 45 42 59 59
Finland: +358 9 471 977
Greece: 30 210 77 93 777
Hungary: +36 80 20 11 99
Ireland (Republic): +352 1 809 2166
Italy: +39 02 6610 1029
Lithuania: +370 523 62052
+370 687 53378
Luxembourg: +352 8002 5500
Netherlands: +31 30 274 88 88
Norway: +47 22 591300
Poland: +48 22 619 66 54
+48 22 619 08 97
Portugal: 808 250 143 (in Portugal only)
+351 21 330 3284
Romania: +40 21318 3606
Slovakia: +421 2 54 77 4 166
Slovenia: +386 41 650 500
Spain: +34 91 562 04 20
Sweden: +46 08-331231
112
Switzerland: 145
United Kingdom: 0870 600 6266 (in the UK only)
U.S.A. & Canada: +1 800 / 331-3148 (ProPharma)
All other countries: +1 651 / 632-6793 (ProPharma - Collect)

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♣ SECTION 2: HAZARDS IDENTIFICATION

2.1. **Classification of the substance or mixture**

Flammable liquid: Category 3 (H226)
Acute oral toxicity: Category 3 (H301)
Inhalation toxicity: Category 4 (H332)
Skin irritation: Category 2 (H315)
Eye irritation: Category 2 (H319)
Specific target organ toxicity – single exposure: Category 3 (H335)
Aspiration toxicity: Category 1 (H304)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

WHO classification ..... Class II, moderately hazardous

Physicochemical hazards ..... The product is flammable.

Health hazards ..... The product is toxic by ingestion and harmful by inhalation. It has irritating properties.

The active ingredient **chlorpyrifos** is a poison (cholinesterase inhibitors). It rapidly enters the body on contact with all skin surfaces and eyes.

Repeated exposures to cholinesterase inhibitors such as **chlorpyrifos** may, without warning, cause increased susceptibility to doses of any cholinesterase inhibitor.

The active ingredient **gamma-cyhalothrin** is very toxic by inhalation.

Environmental hazards ..... The product is very toxic to aquatic organisms.

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... Chlorpyrifos 300 g/l + Gamma-cyhalothrin 10 g/l EC
Contains chlorpyrifos, gamma-cyhalothrin and hydrocarbons, C9, aromatics

Hazard pictograms (GHS02, GHS06, GHS08, GHS09)

Signal word ..... Danger

Hazard statements
H226 ..... Flammable liquid and vapour.
H301 ..... Toxic if swallowed.
H332 ..... Harmful if inhaled.
H315 ..... Causes skin irritation.

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H319 ..... Causes serious eye irritation.
H335 ..... May cause respiratory irritation.
H304 ..... May be fatal if swallowed and enters airways.
H410 ..... Very toxic to aquatic life with long lasting effects.

Supplementary hazard statements
EUH208 ..... Contains gamma-cyhalothrin. May produce an allergic reaction.
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, protective clothing and eye protection or face protection.
P303+P361+P353 ..... IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 ..... IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 ..... Immediately call a POISON CENTER or doctor/physician.
P501 ..... Dispose of contents/container as hazardous waste.

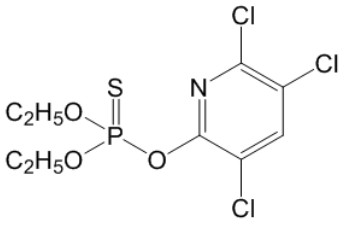
2.3. **Other hazards** ..... None of the ingredients in the product meets the criteria for being PBT or vPvB.

♣ 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.

Active ingredients
Chlorpyrifos ..... Content: 30% w/w
CAS name ..... Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) ester
CAS no. 2921-88-2
IUPAC name ..... O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate
ISO name/EU name ..... Chlorpyrifos
EC no. (EINECS no.) 220-864-4
EU index no. 015-084-00-4
Classification of the ingredient ..... Acute oral toxicity: Category 3 (H301)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)
Structural formula .....



Gamma-cyhalothrin ..... Content: 1% by weight
CAS name ..... Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-pro-

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penyl)-2,2-dimethyl, cyano(3-phenoxyphenyl)methyl ester, [1R-[1α(S*),3α(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

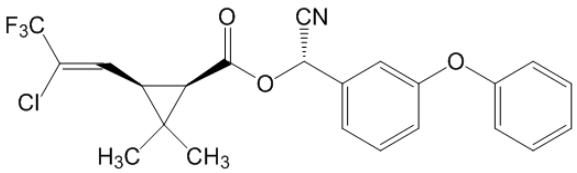
ISO name/EU name ..... Gamma-cyhalothrin

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, C9, aromatics Reg. no. 01-2119455851-35	64		918-668-5	Flam. Liq. 3 (H226) STOT SE 3 (H335) STOT SE 3 (H336) Asp. Tox. 1 (H304) Aquatic Chronic 2 (H411)
Calcium dodecylbenzenesulphonate	1.5	26264-06-2	EINECS no.: 247-557-8	Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Aquatic Chronic 2 (H411)

♣ 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.

Inhalation ..... If exposure occurs, immediately remove from it. 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.

Skin contact ..... Do not start with flushing with water, but wipe off with dry cloth or using talcum powder. Then wash with water and soap and apply

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lidocaine, fatty oil or cream. See physician immediately if feeling unwell.

Eye contact ..... 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.

Ingestion ..... Call a doctor or get medical attention immediately. Make the exposed person rinse mouth and then drink 1 or 2 glasses of water (not milk or cream or other substance containing fats, which may enhance absorption). Induce vomiting only if:
1. a significant amount (more than a mouthful) has been ingested
2. patient is fully conscious
3. medical aid is not readily available
4. time since ingestion is less than one hour.

Let the patient induce vomiting by touching the back of the throat with a finger. If vomiting occurs, take care that vomit does not enter airways. Let the exposed person rinse mouth and drink fluids again.

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

The first symptom to appear may be irritation. On contact, **gamma-cyhalothrin** may cause feelings of burning, tingling or numbness in exposed areas (paraesthesia).
Symptoms of cholinesterase inhibition (**chlorpyrifos**): nausea, headache, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.

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

If any sign of poisoning occurs, call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to a mixed organophosphorus and 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 lidocaine or a vitamin E cream. For this purpose, lidocaine or vitamin E cream should be available at the workplace.

It may be helpful to show this safety data sheet to physician.

Notes to physician ..... **Chlorpyrifos** is a cholinesterase inhibitor affecting the central and peripheral nervous systems producing respiratory depression.

Gamma-cyhalothrin disturbs the nervous systems as well, causing unspecific reactions (at larger doses: tremors, convulsions and coma).

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The product contains petroleum distillates which may pose an aspiration pneumonia hazard.

Gamma-cyhalothrin – contact ..... 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 decrease, but may prolong the irritation. Hot water may increase the pain.

Cholinesterase inhibition – treatment Much information on (acetyl)cholinesterase inhibition by organophosphate insecticides and its treatment can be found on the internet.

Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required.

Antidote: If symptoms of cholinesterase inhibition (see subsection 4.2.) are present, administer atropine sulphate, which often is a lifesaving antidote, in large doses, TWO to FOUR mg intravenously or intramuscularly as soon as possible. Repeat at 5 to 10 minute intervals until signs of atropinisation appear and maintain full atropinisation until all organophosphate is metabolised.

Obidoxime chloride (Toxogonin), alternatively pralidoxime chloride (2-PAM), may be administered as an adjunct to, but not a substitute for atropine sulphate. Treatment with oxime should be maintained as long as atropine sulphate is administered.

At first sign of pulmonary oedema the patient should be given supplementary oxygen and treated symptomatically.

Relapse can occur after initial improvement.
VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING.

♣ 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, malodorous and inflammable compounds such as nitrogen oxides, hydrogen chloride, hydrogen fluoride, hydrogen sulphide, ethyl mercaptan, diethyl sulphide, sulphur dioxide, hydrogen cyanide, carbon monoxide, carbon dioxide, phosphorus pentoxide and various chlorinated and fluorinated organic compounds.

5.3. **Advice for firefighters** ..... Use water spray to keep fire-exposed containers cool. Approach fire

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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 take preventive measures for the avoidance of spills. If spillage occurs, it has to be removed immediately and the area cleaned 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 1 tonne 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. Spills should be removed as soon as possible. Keep unprotected persons away from the spill area. Remove sources of ignition. Avoid and reduce vapour and mist formation 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.

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).

Use non-sparking tools and equipment. Surface water drains should be covered if appropriate. Minor spills on the floor or other impervious surface should be absorbed onto an absorptive material such as universal binder, hydrated lime, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Clean area with alkaline water/isopropanol mixture (see subsection 7.1.). Absorb wash liquid onto 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

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the contaminated water. The contaminated water must be collected and removed for treatment or disposal.

6.4. **Reference to other sections** .....

See subsection 7.1. for fire prevention.
See subsection 8.2. for personal protection.
See section 13 for disposal.

♣ SECTION 7: HANDLING AND STORAGE

7.1. **Precautions for safe handling** .....

The product is flammable. Formation of explosive vapour-air mixtures is possible. Fire prevention measures should be taken. Keep away from sources of ignition and protect from exposure to fire and heat. Take precautions against static discharge.

If the temperature of the liquid is below 43°C, which is 10°C below its flash point of 53°C, the fire and explosion hazard is considered minor. At higher temperatures the hazard gradually becomes more serious.

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. Clothes that have been heavily drenched must be discarded as hazardous waste. Do not wash and reuse them.

Inhalation of vapours of the product can cause lowered consciousness, which increases the risks of operating machinery and driving.

The respirator should be cleaned and filter replaced according to the accompanying instructions.

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.

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

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 frost and heat.

Keep in tightly 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.

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 personal exposure limits have been established for gamma-cyhalothrin. An internal value of 0.02 mg/m^3 (8-hr TWA) is recommended by the manufacturer.

		Year	
Chlorpyrifos	ACGIH (USA) TLV	2015	TWA 0.1 mg/m^3, inhalable fraction and vapour Skin notation; BEI
	OSHA (USA) PEL	2015	Not established
	EU, 2000/39/EC as amended	2009	Not established
	Germany, MAK	2014	Not established; BAT
	HSE (UK) WEL	2011	8-h TWA 0.2 mg/m^3 STEL 0.6 mg/m^3; 15-minute reference period Skin notation

Aromatic hydrocarbons .....

100 ppm total hydrocarbon is recommended. The mixture contains trimethyl benzene. The ACGIH recommends a TLV-TWA of 25 ppm (123 g/m^3) for trimethyl benzene.

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

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Monitoring methods ..... Persons working with this product for a longer period should have frequent blood tests of their cholinesterase levels. If the cholinesterase level falls below a critical point, no further exposure should be allowed until it has been determined by means of blood tests that the cholinesterase level has returned to normal.

Chlorpyrifos
DNEL, systemic ..... 0.01 mg/kg bw/day
PNEC, aquatic environment ..... 14 ng/l

Gamma-cyhalothrin
DNEL, systemic ..... 0.034 mg/kg bw/day
PNEC, aquatic environment ..... 0.044 ng/l

Aromatic hydrocarbons
DNEL, dermal ..... 25 mg/kg bw/day
DNEL, inhalation ..... 150 mg/m^3
PNEC, aquatic environment ..... Not applicable

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.

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 — 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 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.

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Eye protection ..... Wear face mask 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	Yellow liquid
Odour	Of aromatic hydrocarbons
Odour threshold	Not determined
pH	1% dilution in water: approx. 5.2
Melting point/freezing point	Below 0°C
Initial boiling point and boiling range	Decomposes
	Aromatic hydrocarbons : 155 - 181°C
Flash point	53°C (Pensky-Martens closed cup)
Evaporation rate	(Butyl acetate = 1)
	Aromatic hydrocarbons : 0.15
Flammability (solid/gas)	Not applicable (liquid)
Upper/lower flammability or explosive limits	**Aromatic hydrocarbons** : 0.8 - 7.0 vol% (≈ 0.8 - 7.0 kPa)
Vapour pressure	**Chlorpyrifos** : 2.7 x 10^{-3} Pa at 25°C
	1.8 x 10^{-2} Pa at 35°C
	Gamma-cyhalothrin : 1.0 x 10^{-7} Pa at 20°C
	3.5 x 10^{-7} Pa at 25°C
	Aromatic hydrocarbons : 200 Pa at 20°C
	710 Pa at 38°C
Vapour density	(Air = 1)
	Aromatic hydrocarbons : > 1
Relative density	1.003 at 20°C
Solubility(ies)	Solubility of **chlorpyrifos** in:
	ethyl acetate miscible
	toluene miscible
	hexane 774 g/l at 20°C
	water 0.94 mg/l at 25°C
	Solubility of **gamma-cyhalothrin** at 19°C in:
	ethyl acetate > 500 g/l
	heptane 30.7g/l
	water 0.0021 mg/l (at 20°C)

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Partition coefficient n-octanol/water	**Chlorpyrifos**	: log K_{ow} = 4.7
	Gamma-cyhalothrin	: log K_{ow} = 5.65
	Aromatic hydrocarbons	: some of the main components have log K_{ow} = 3.4 - 4.1
Autoignition temperature	**Aromatic hydrocarbons**	: > 400°C
Decomposition temperature	Not determined (however, see subsection 10.2.)	
Viscosity	2.33 mPa.s at 20°C 1.70 mPa.s at 40°C	
Explosive properties.....	Not explosive	
Oxidising properties	Not oxidising	

9.2. **Other information**

Miscibility ..... The product is emulsifiable in water.

♣ SECTION 10: STABILITY AND REACTIVITY

10.1. **Reactivity** ..... To our knowledge, the product has no special reactivities.

10.2. **Chemical stability** ..... **Chlorpyrifos** will decompose rapidly when heated to temperatures above 160°C, significantly increasing the risk of explosion. Direct local heating of the product such as electric heating or by steam must be avoided.

The decomposition is to a considerable extent dependent on time as well as temperature due to self-accelerating exothermic and autocatalytic reactions. The reactions involve rearrangements and polymerisation releasing volatile malodorous and inflammable compounds such as diethyl sulphide and ethyl mercaptan.

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** ..... Strong alkalis and strong oxidising compounds. The product can corrode metals (but does not meet the criteria for classification).

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.

Product

Acute toxicity ..... The product is toxic by ingestion and inhalation. It is considered as less harmful by skin contact. The acute toxicity is measured as:

Route(s) of entry	- ingestion	LD_{50}, oral, rat (female): 55 mg/kg (method OECD 425)
	- skin	LD_{50}, dermal, rat: > 5000 mg/kg (method OECD 402) *
	- inhalation	LC_{50}, inhalation, rat: 0.5 - 2.0 mg/l/4 h (method OECD 403)

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Skin corrosion/irritation	Irritating to skin (method OECD 404).
Serious eye damage/irritation	Irritating to eyes (method OECD 405).
Respiratory or skin sensitisation ...	Not a skin sensitizer (method OECD 429). *
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 found to have adverse effects on reproduction. *
STOT – single exposure	May cause irritation of airways.
STOT – repeated exposure	The following was measured on the active ingredient **chlorpyrifos**: Target organ: nervous system (cholinesterase inhibition) LOAEL: 1 mg/kg bw/day in a 90-day rat study. At this exposure level, minor cholinesterase inhibition was found which generally does not result in observable effects or discomfort. A level for observable effects (LOEL) has not been determined. * The following is found for 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 presents an aspiration pneumonia hazard.
Symptoms and effects, acute and delayed	Irritation may occur by all routes of exposure to the product. 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. **Chlorpyrifos** may cause cholinesterase inhibition. Symptoms of cholinesterase inhibition: nausea, headache, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.
Chlorpyrifos Toxicokinetics, metabolism and distribution	Chlorpyrifos is rapidly absorbed and excreted following oral administration. It is widely distributed in the body and extensively

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		metabolised. There is no evidence for accumulation.
Acute toxicity		The substance is toxic by ingestion. Toxicity by inhalation is not known. It is considered as less harmful by skin contact. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat (male): 276 mg/kg (method FIFRA 81.01)
		LD_{50}, oral, rat (female): 350 mg/kg
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg (method FIFRA 81.02) *
	- inhalation	LC_{50}, inhalation, rat: not available
Skin corrosion/irritation		Slightly irritating to skin (method FIFRA 81.05). *
Serious eye damage/irritation		Slightly irritating to eyes (method FIFRA 81.04). *
Respiratory or skin sensitisation ...		Not sensitising (method FIFRA 81.06). *

Gamma-cyhalothrin

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)
		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, C9, aromatics

Acute toxicity		The substance is not considered as harmful. * The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 3592 mg/kg (method similar to OECD 401)
	- skin	LD_{50}, dermal, rabbit: > 3160 mg/kg (method similar to OECD 402)
	- inhalation	LC_{50}, inhalation, rat: > 6.2 mg/l/4 h (method similar to OECD 403)
Skin corrosion/irritation		Mildly irritating to skin at prolonged exposure. Can cause skin dryness (method similar to OECD 404).

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Serious eye damage/irritation ..... May cause mild, short-lasting discomfort to eyes (method similar to OECD 405). *

Respiratory or skin sensitisation ... Not expected to cause allergic reactions (method similar to OECD 406). *

Aspiration hazard ..... Aromatic hydrocarbons present an aspiration hazard.

Calcium dodecylbenzenesulphonate

Acute toxicity ..... The substance is not considered as harmful by skin contact, ingestion and inhalation. * The acute toxicity is measured as:

Route(s) of entry	- ingestion	LD_{50}, oral, rat: 4000 mg/kg
	- skin	LD_{50}, dermal, rat: not available
	- inhalation	LC_{50}, inhalation, rat: not available

Skin corrosion/irritation ..... Irritating to skin.

Serious eye damage/irritation ..... Irritating to eyes with the potential to cause permanent eye damage.

♣ SECTION 12: ECOLOGICAL INFORMATION

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

The ecotoxicity of the active ingredients is:			**Chlorpyrifos**	**Gamma-cyhalothrin**
- Fish	Rainbow trout (*Oncorhynchus mykiss*)	96-h LC_{50}	3 µg/l	0.07 µg/l
- Invertebrates	Daphnids (*Daphnia magna*)	48-h LC_{50}	1.7 µg/l	0.1 µg/l
		21-day NOEC	0.056 µg/l	0.0022 µg/l
- Algae	Green algae (*Scenedesmus subspicatus*)	96-h IC_{50}	0.48 mg/l	
	(*Selenastrum capricornutum*)	72-h IC_{50}		> 2.85 mg/l
- Birds	Bobwhite quail (*Colinus virginianus*)	LD_{50}	13.3 mg/kg	> 2000 mg/kg
	Mallard duck (*Anas platyrhynchos*)	LD_{50}	75.6 mg/kg	
- Insects	Honey bees (*Apis mellifera*)	LD_{50}, oral	0.36 µg/bee	4.2 µg/bee
		LD_{50}, contact	0.070 µg/bee	0.005 µg/bee

12.2. **Persistence and degradability** .... **Chlorpyrifos** is biodegradable, but does not meet the criteria for being readily biodegradable. It undergoes degradation in the environment and in waste water treatment plants. No adverse effects are found at concentrations up to 100 mg/l in waste water treatment plants. Degradation occurs both aerobically and anaerobically, biologically as well as abiologically.

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Primary degradation half-lives of **chlorpyrifos** vary with circumstances, but are usually around 4 - 10 weeks in soil and water. pH has a major influence. Degradation will increase at higher pH.

Gamma-cyhalothrin is not readily biodegradable. Its 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.

Aromatic hydrocarbons are not readily biodegradable. However, they are expected to be degraded in the environment at a moderate rate. A BOD_5/COD ratio of 0.43 was measured. When evaporated, the mixture is expected to degrade rapidly in the air.

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 coefficients.

Chlorpyrifos has the potential to bioaccumulate, but is rapidly excreted (with half-life 2 - 3 days). The bioaccumulation factor of chlorpyrifos is measured to be 1375 for whole fish (rainbow trout).

Gamma-cyhalothrin has the potential to bioaccumulate, but in view of its high acute toxicity to aquatic organisms, bioaccumulation is not relevant.

Aromatic hydrocarbons have a moderate potential to bioaccumulate if continuous exposure is maintained. Most components can be metabolised by many organisms, bacteria, fungi, etc. Bioaccumulation factors (BCFs) of some of the main components are 300 - 400 (by model calculation).

12.4. **Mobility in soil** .....

Chlorpyrifos is not mobile in the environment, but is strongly absorbed to soil

Gamma-cyhalothrin is not mobile in soil.

Aromatic hydrocarbons are not mobile in the environment, but they are highly volatile and will rapidly evaporate to the air if released onto water or on the surface of soil. They float and can migrate to sediment.

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

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should be regarded as hazardous waste.

Disposal of waste and packagings 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 following order:
1. Reuse or recycling should first be considered. Reuse is prohibited except by the authorisation holder. 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** 2903

14.2. **UN proper shipping name** ..... Pesticide, liquid, toxic, flammable, n.o.s. (chlorpyrifos, gamma-cyhalothrin and alkyl(C3)benzenes)

14.3. **Transport hazard class(es)** 6.1 (3)

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.

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♣ SECTION 15: REGULATORY INFORMATION

15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture**

Seveso category (Dir. 2012/18/EU): toxic
Second Seveso category: dangerous for the environment
Third Seveso category: flammable

The Young Worker Directive (94/33/EC) prohibits people under the age of 18 to work with this product.

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.

♣ SECTION 16: OTHER INFORMATION

Relevant changes in the safety data sheet ..... Minor corrections only

List of abbreviations .....

ACGIH	American Conference of Governmental Industrial Hygienists
BAT	Biologische Arbeitsstoff-Toleranzwert
BEI	Biological Exposure Index
BOD_5	Biological Oxygen Demand within 5 days
CAS	Chemical Abstracts Service
COD	Chemical Oxygen Demand
Dir.	Directive
DNEL	Derived No Effect Level
EC	Emulsifiable Concentrate, or European Community
EINECS	European INventory of Existing Commercial Chemical Substances
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
HSE	Health & Safety Executive, UK
IBC	International Bulk Chemical code
IC_{50}	50% Inhibition Concentration
ISO	International Organisation for Standardisation
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
MAK	Maximale Arbeitspaltz-Konzentration
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOEC	No Observed Effect Concentration
n.o.s.	Not otherwise specified

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OECD	Organisation for Economic Development and Cooperation
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulative, Toxic
PEL	Personal Exposure Limit
PNEC	Predicted No Effect Concentration
Reg.	Registration, or Regulation
STEL	Short-Term Exposure Limit
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
TWA	Time Weighed Average
vPvB	very Persistent, very Bioaccumulative
WEL	Workplace Exposure Limit
WHO	World Health Organisation

References ..... Data measured on the product are unpublished company data. Data on ingredients are available from published literature and can be found several places.

Method for classification ..... Flammable liquid: test data
Acute oral toxicity: test data
Inhalation toxicity: test data
Skin irritation: test data
Eye irritation: test data
Specific target organ toxicity – single exposure: calculation rules
Aspiration toxicity: test data
Hazards to the aquatic environment: calculation rules

Used hazard statements .....

H226	Flammable liquid and vapour.
H301	Toxic if swallowed.
H304	May be fatal if swallowed and enters airways.
H312	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.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H372	Causes damage to nervous system through prolonged 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.
EUH208	Contains gamma-cyhalothrin. May produce an allergic reaction.
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

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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 FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

Prepared by: FMC Corporation / Cheminova A/S / GHB