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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, solvent naphtha (petroleum), light aromatic**
1.2.	**Relevant identified uses of the substance or mixture and uses advised against**	Can be used as insecticide only. The product is shipped ready for the end-user or may need to be filled into its final containers.
1.3.	**Details of the supplier of the safety data sheet**	***CHEMINOVA A/S*** P.O. Box 9 DK-7620 Lemvig Denmark sds@cheminova.dk
1.4.	**Emergency telephone number** ...	(+45) 97 83 53 53 (24 h; for emergencies only)

♣ SECTION 2: HAZARDS IDENTIFICATION

2.1.	**Classification of the substance or mixture**	See section 16 for full text of R-phrases and hazard statements.
	DPD classification of the product according to Dir. 1999/45/EC as amended	R10 T;R25 Xn;R20 Xi;R36/37/38 R65 N;R50/53
	CLP classification of the product according to Reg. 1272/2008 as amended	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 ..... Guidelines to Classification 2009	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.

Chlorpyrifos is a dangerous poison (cholinesterase inhibitor). It rapidly enters the body on contact with all skin surfaces and eyes. Exposed persons must receive prompt medical treatment.

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 Dir. 1999/45/EC as amended

Hazard symbols .....

T

Toxic

N

Dangerous for the environment

Contains chlorpyrifos, gamma-cyhalothrin, solvent naphtha (petroleum), light aromatic

R-phrases

R10 ..... Flammable.
R25 ..... Toxic if swallowed.
R20 ..... Harmful by inhalation.
R36/37/38 ..... Irritating to eyes, respiratory system and skin.
R65 ..... Harmful: may cause lung damage if swallowed.
R50/53 ..... Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrases

S24 ..... Avoid contact with skin.
S28 ..... After contact with skin, immediately wipe off with dry cloth followed by washing with plenty of water and soap.
S36/37/39 ..... Wear suitable protective clothing, gloves and eye/face protection.
S45 ..... In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S60 ..... This material and its container must be disposed of as hazardous waste.
S61 ..... Avoid release to the environment. Refer to special instructions/safety data sheets.

Other mentions ..... Contains gamma-cyhalothrin. May produce an allergic reaction. To avoid risks to man and the environment, comply with the instructions of use.

Additional phrases for final use of the product for plant protection

S2 ..... Keep out of the reach of children.
S13 ..... Keep away from food, drink and animal feedingstuffs.

S23	Do not breathe spray.
S29.....	Do not empty into drains.
SP1	Do not contaminate water with the product or its container (Do not clean application equipment near surface water/Avoid contamination via drains from farmyards and roads).

According to EU Reg. 1272/2008 as amended

Product identifier	Chlorpyrifos 300 g/l + Gamma-cyhalothrin 10 g/l EC Contains chlorpyrifos, gamma-cyhalothrin, solvent naphtha (petroleum), light aromatic
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.
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

EUH066	Repeated exposure may cause skin dryness and cracking.
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.
Supplementary phrase for final use of the product for plant protection: SP1	Do not contaminate water with the product or its container (Do not clean application equipment near surface water/Avoid contamination via drains from farmyards and roads).

Precautionary statements

P261	Avoid breathing vapours.
P280	Wear protective gloves and eye/face protection.
P273	Avoid release to the environment.
P310	Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501	Dispose of contents/container as hazardous waste.

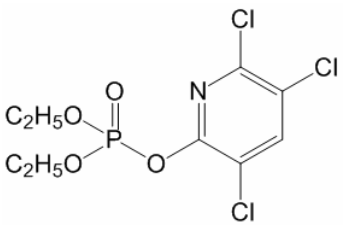
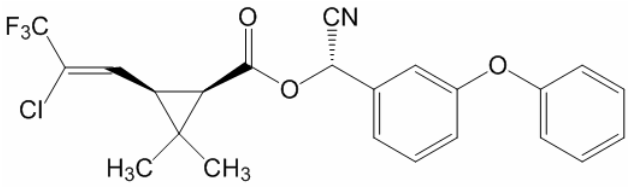
2.3. **Other hazards** ..... None of the ingredients meets the criteria for being PBT or vPvB.

♣ 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 R-phrases and hazard statements.

Active ingredient

Chlorpyrifos	Content: 30% by weight
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
DSD classification of the ingredient	T;R25 N;R50/53
CLP 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-propenyl)-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. (list no.)	616-373-3
EU index no.	None
DSD classification of the ingredient	T+;R26 T;R25 Xn;R21 R43 R48/22 N;R50/53
CLP 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) Specific target organ toxicity – 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. (EINECS no.)	DSD classification	CLP classification
Solvent naphtha (petroleum), light aromatic Reg. no. 01-2119455851-35	64	64742-95-6	265-199-0	R10 Xn;R65 Xi;R37 R66 R67 N;R51/53 Harmful, dangerous for the environment	Flam. Liq. 3 (H226) STOT SE 3 (H335 + H336) Asp. Tox. 1 (H304) Aquatic Chronic 2 (H411)
Calcium dodecylbenzene sulphonate	1.5	26264-06-2	247-557-8	Xi;R38-41 N;R51/53 Irritant, dangerous for the environment	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 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 him/her rinse mouth and drink fluids again.

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

On contact, **gamma-cyhalothrin** may cause feelings of burning, tingling or numbness in exposed areas (paraesthesia).
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.

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

If there is any sign of poisoning, 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.

In an industrial setting the antidote atropine sulphate should be available at the workplace.

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.

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).

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 (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: FIREFIGHTING 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, ethyl mercaptan, diethyl sulphide, sulphur dioxide, hydrogen fluoride, hydrogen cyanide, carbon monoxide, carbon dioxide and various chlorinated and fluorinated organic compounds.
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.

♣ 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 ton 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 boots. Stop the source of the spill immediately if safe to do so. Keep unprotected persons away from the spill area. Remove sources of ignition. Avoid and reduce 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. 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, hydrated lime, bentonite 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.

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.

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 recommended to avoid all personal contact with the product, if possible by using closed systems with remote system control. Otherwise, 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. 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.

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. 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

		Year	
Chlorpyrifos	ACGIH (USA) TLV	2011	TWA 0.1 mg/m^3, measured as inhalable fraction and vapour Skin notation; BEI
	OSHA (USA) PEL	2011	Not established
	EU, 2000/39/EC as amended	2009	Not established
	Germany, MAK	2011	Not established; BAT
	HSE (UK) WEL	2007	8-h TWA 0.2 mg/m^3 STEL 0.6 mg/m^3; 15-minute reference period Skin notation

Gamma-cyhalothrin ..... To our knowledge, not established. An internal value of 0.02 mg/m^3 (8-hr TWA) is recommended by the manufacturer.

Solvent naphtha ..... 100 ppm total hydrocarbon is recommended. Solvent naphtha contains trimethyl benzene. The ACGIH recommends a TLV-TWA

of 25 ppm (123 g/m^3) for trimethyl benzene.

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

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, oral ..... 0.005 mg/kg bw/dag
PNEC, aquatic environment ..... 0.046 mg/l

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

Solvent naphtha
DNEL, dermal ..... 25 mg/kg bw/dag
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.

Respiratory protection — In the event of an accidental discharge of the material which produces a vapour or mist, workers must put on officially approved respiratory protection equipment with a universal filter type including particle filter.

Protective gloves ..... Wear long 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 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 PE will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of appreciable 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		Aromatic
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
	Solvent naphtha	: 140 - 200°C
Flash point		53°C (Pensky-Martens closed cup)
Evaporation rate		(Butyl acetate = 1)
	Solvent naphtha	: 0.16
Flammability (solid/gas)		Not applicable (the product is a liquid)
Upper/lower flammability or explosive limits	**Solvent naphtha**	: 0.7 - 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
	Solvent naphtha	: 200 Pa at 20°C 700 Pa at 38°C
Vapour density		(Air = 1)
	Solvent naphtha	: > 1
Relative density		1.003 at 20°C
Solubility(ies)	**Chlorpyrifos**	: miscible with toluene miscible with dichloromethane miscible with acetone miscible with ethyl acetate 774 g/l in hexane at 20°C 290 g/l in methanol at 20°C 0.94 mg/l in water at 25°C

Solubility of **gamma-cyhalothrin** at 19°C in:

acetone	> 500 g/l
ethyl acetate	> 500 g/l
1,2-dichloroethane	> 500 g/l
p-xylene	> 500 g/l
heptane	30.7g/l
methanol	138 g/l
n-octanol	36.6 g/l
water	0.0021 mg/l (at 20°C)

Partition coefficient n-octanol/water	**Chlorpyrifos**	: log K_{ow} = 4.7
	Gamma-cyhalothrin	: log K_{ow} = 5.65
	Solvent naphtha	: some of the main components have log K_{ow} = 3.4 - 4.1
Autoignition temperature	**Solvent naphtha**	: > 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.

Gamma-cyhalothrin decomposes on heating. Thermal decomposition will evolve toxic and irritant vapours.

10.3. **Possibility of hazardous reactions** None known.

10.4. **Conditions to avoid** ..... Heating of the product will produce harmful and irritant vapours. The product is flammable and can be ignited by e.g. flame, spark or hot surface.

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**

Product

Acute toxicity		The product is harmful 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)
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). Based on available data,

the classification criteria are not met. (B.o.a.d.t.c.c.a.n.m.)

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

Acute toxicity ..... The substance is toxic by ingestion. Toxicity by inhalation is not known. Chlorpyrifos is considered as less harmful by skin contact. The acute toxicity is measured as:

Route(s) of entry	- ingestion	LD_{50}, oral, rat: 172 - 320 mg/kg (method FIFRA 81.01)
	- 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). B.o.a.d.t.c.c.a.n.m.

Serious eye damage/irritation ..... Slightly irritating to eyes (method FIFRA 81.04). B.o.a.d.t.c.c.a.n.m.

Respiratory or skin sensitisation ... Not sensitising (method FIFRA 81.06). B.o.a.d.t.c.c.a.n.m.

Germ cell mutagenicity ..... Chlorpyrifos is not mutagenic (23 studies). B.o.a.d.t.c.c.a.n.m.

Carcinogenicity ..... No carcinogenic effects have been observed for chlorpyrifos (5 studies). B.o.a.d.t.c.c.a.n.m.

Reproductive toxicity ..... No effects on fertility are found for chlorpyrifos (3 studies). Chlorpyrifos is not teratogenic (not causing birth defects) in rats at levels up to 15 mg/kg bw/day (a maternally toxic level; 2 studies). B.o.a.d.t.c.c.a.n.m.

STOT – single exposure ..... Mild and transient neurotoxic effects were observed for chlorpyrifos at dose level 50 mg/kg bw. B.o.a.d.t.c.c.a.n.m.

STOT – repeated exposure ..... 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. B.o.a.d.t.c.c.a.n.m.

Gamma-cyhalothrin

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). B.o.a.d.t.c.c.a.n.m.
Serious eye damage/irritation		Not irritating to eyes (method OECD 405). B.o.a.d.t.c.c.a.n.m.
Respiratory or skin sensitisation ...		Weakly sensitising (method OECD 406).
Germ cell mutagenicity		No results from germ cell mutagenicity studies are available for gamma-cyhalothrin. In four other mutagenicity tests no evidence of mutagenicity was seen. B.o.a.d.t.c.c.a.n.m.
Carcinogenicity		Tests on similar substances have shown that gamma-cyhalothrin is unlikely to be carcinogenic. B.o.a.d.t.c.c.a.n.m.
Reproductive toxicity		No effects on fertility are found in tests on similar substances in animal tests at maternal non-toxic doses (1.5 mg/kg/day). No teratogenic (birth defects causing) effects are found for gamma-cyhalothrin (method OECD 414). B.o.a.d.t.c.c.a.n.m.
STOT – single exposure		No other specific effects after single exposure to gamma-cyhalothrin than already mentioned have been observed. B.o.a.d.t.c.c.a.n.m.
STOT – repeated exposure		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). B.o.a.d.t.c.c.a.n.m.

Solvent naphtha (petroleum), light aromatic

Acute toxicity		The substance is not considered as harmful. B.o.a.d.t.c.c.a.n.m. 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 (method similar to OECD 403)
Skin corrosion/irritation		Can cause skin dryness (method similar to OECD 404).
Serious eye damage/irritation		May cause mild, short-lasting discomfort to eyes (method similar to OECD 405). B.o.a.d.t.c.c.a.n.m.

Respiratory or skin sensitisation ... Not expected to cause skin sensitisation (method similar to OECD 406). B.o.a.d.t.c.c.a.n.m.

Germ cell mutagenicity ..... Not expected to be mutagenic (methods similar to OECD 471, 475, 476 and 479). B.o.a.d.t.c.c.a.n.m.

Carcinogenicity ..... For petroleum solvents in general, IARC has considered the evidence for carcinogenicity as inadequate. B.o.a.d.t.c.c.a.n.m.

The product does not contain relevant amounts of any aromatic hydrocarbon identified as carcinogenic.

Reproductive toxicity ..... Not expected to cause harmful effects on reproduction (methods similar to OECD 414 and 416). B.o.a.d.t.c.c.a.n.m.

STOT – single exposure ..... Vapour can cause temporary irritation of airways and may cause headache and dizziness.

STOT – repeated exposure ..... Organic solvents generally are suspected to cause irreversible damage to nervous system on repeated exposure.

Prolonged and/or repeated skin contact may defat the skin resulting in possible irritation and dermatitis.

Repeated oral exposure is not expected to cause effects at exposure levels corresponding to the classification criteria (measured on similar products; methods OECD 408 and 452).

Aspiration hazard ..... Solvent naphtha presents an aspiration hazard.

Calcium dodecylbenzene sulphonate

Acute toxicity ..... The substance is not considered as harmful by skin contact, ingestion and inhalation. B.o.a.d.t.c.c.a.n.m. 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.

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.

Solvent naphtha is not readily biodegradable. However, it is expected to be degraded in the environment at a moderate rate. A BOD_5/COD ratio of 0.43 was measured. When evaporated, it 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.

Solvent naphtha has 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.

Solvent naphtha is not mobile in the environment, but it is highly volatile and will rapidly evaporate to the air if released onto water or on the surface of soil. It floats 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 should be regarded as hazardous waste.

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 ..... Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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

♣ SECTION 14: TRANSPORT INFORMATION

14.1. **UN number** 2903

14.2. **UN proper shipping name** ..... Pesticide, liquid, toxic, flammable, n.o.s. (chlorpyrifos, gamma-cyhalothrin and alkyl(C3-C5)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** ..... 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 tankers.

♣ SECTION 15: REGULATORY INFORMATION

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

Seveso category in Annex I, part 2, to Dir. 96/82/EC: toxic
Second Seveso category: dangerous for the environment

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

All ingredients in this product are covered by EU chemical legislation.

15.2. **Chemical safety assessment** ..... A chemical safety assessment has not been performed.

♣ SECTION 16: OTHER INFORMATION

Relevant changes in the SDS ..... Toxicity data measured on the product have been added. Classifications have been changed accordingly.

List of abbreviations .....

ACGIH	American Conference of Governmental Industrial Hygienists
BAT	Biologische Arbeitsstoff-Toleranzwert
BEI	Biological Exposure Index
B.o.a.d.t.c.c.a.n.m.:	Based on available data, the classification criteria are not met.
BOD_5	Biological Oxygen Demand (for 5 days)
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging; refers to EU regulation 1272/2008 as amended
COD	Chemical Oxygen Demand
Dir.	Directive
DNEL	Derived No Effect Level
DPD	Dangerous Preparation Directive; refers to Dir. 1999/45/EC as amended
DSD	Dangerous Substance Directive; refers to Dir. 67/548/EEC as amended
EC	European Community, or Emulsifiable Concentrate
EINECS	European Inventory of Existing Commercial Chemical Substances
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GHS	Globally Harmonized classification and labelling System of chemicals, Fourth revised edition 2011
HSE	Health & Safety Executive, UK
IARC	International Agency for Research on Cancer
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
OECD	Organisation for Economic Cooperation and Development
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulative, Toxic
PE	Polyethylene
PEL	Personal Exposure Limit
PNEC	Predicted No Effect Concentration
Reg.	Regulation
R-phrase	Risk phrase
SDS	Safety Data Sheet
SE	Single Exposure
SP	Safety Precaution
S-phrase	Safety phrase
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 method
Aspiration toxicity: calculation method
Hazards to the aquatic environment: calculation method

Used R-phrases .....

R10	Flammable.
R20	Harmful by inhalation.
R21	Harmful in contact with skin.
R25	Toxic if swallowed.
R26	Very toxic by inhalation.
R36/37/38	Irritating to eyes, respiratory system and skin.
R37	Irritating to respiratory system.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R43	May cause sensitisation by skin contact.
R48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful: may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness and cracking.
R67	Vapours may cause drowsiness and dizziness.

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Used CLP 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.
	EUH066	Repeated exposure may cause skin dryness and cracking.
	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 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.

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