SAFETY DATA SHEET

Lambda-cyhalothrin 57% MUC (for 9.7 CS)

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

1.1. **Product identifier** ..... **Lambda-cyhalothrin 57% MUC (for 9.7 CS)**
Contains lambda-cyhalothrin and hydrocarbons, C9, aromatics

1.2. **Relevant identified uses of the substance or mixture and uses advised against** ..... Can be used for production of insecticides 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**

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 (PROSAR)
All other countries: +1 651 / 632-6793 (PROSAR - Collect)

For fire, leak, spill or other accident emergencies:

U.S.A.: +1 800 / 424 9300 (CHEMTREC)
All other countries: +1 703 / 527 3887 (CHEMTREC - Collect)

SECTION 2: HAZARDS IDENTIFICATION

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

Flammable liquid: Category 3 (H226)
Acute oral toxicity: Category 3 (H301)
Acute dermal toxicity: Category 4 (H312)
Acute inhalation toxicity: Category 2 (H330)
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 ..... Lambda-cyhalothrin is very toxic by inhalation and toxic if swallowed. Chronic exposure may cause functional changes in the central and peripheral nervous systems.

Contact with the product causes paraesthesia which can be quite painful, but this effect is passing and harmless at low exposure.

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

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... Lambda-cyhalothrin 57% MUC (for 9.7 CS)
Contains lambda-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.
H304 ..... May be fatal if swallowed and enters airways.
H312 ..... Harmful in contact with skin.
H330 ..... Fatal if inhaled.
H335 ..... May cause respiratory irritation.
H410 ..... Very toxic to aquatic life with long lasting effects.

Supplementary hazard statements
EUH066 ..... Repeated exposure may cause skin dryness and cracking.
EUH401 ..... To avoid risks to human health and the environment, comply with the instructions of use.

Precautionary statements
P260 ..... Do not breathe vapours.
P280 ..... Wear protective gloves, protective clothing and eye protection or face protection.

P264 ..... Immediately call a POISON CENTER or doctor/physician.
P310 ..... Wash hands thoroughly after handling.
P361+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.

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 ingredient

Lambda-cyhalothrin ..... Content: 57% by weight
CAS name ..... Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester, [1α(*S**),3α(*Z*)]-(±)-
CAS no. 91465-08-6
IUPAC name(s) ..... Equal amounts of (*S*)-α-cyano-3-phenoxybenzyl (*Z*)-(1*R*,3*R*)-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate and (*R*)-α-cyano-3-phenoxybenzyl (*Z*)-(1*S*,3*S*)-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate
ISO name/EU name ..... Lambda-cyhalothrin
EC no. (EINECS no.) ..... None
EU index no. 607-252-00-6
Classification of the ingredient ..... Acute oral toxicity: Category 3 (H301)
Acute dermal toxicity: Category 3 (H311)
Acute inhalation toxicity: Category 2 (H330)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

Reportable ingredient	Content (% w/w)	CAS no.	EC no.	Classification
Hydrocarbons, C9, aromatics Reg. no. 01-2119455851-35	43		918-668-5	Flam. Liq. 3 (H226) STOT SE 3 (H335) STOT SE 3 (H336) Asp. Tox. 1 (H304) 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. People who come to rescue the victim should apply all required safety measures.

Inhalation ..... 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, start artificial respiration immediately and

maintain until a physician takes charge of the exposed person. Use a bag valve mask or similar device to perform artificial respiration.

Skin contact ..... 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.

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 ..... 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). Let him/her induce vomiting by touching the back of the throat with a finger. 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.

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

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

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 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 (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.

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

Notes to physician ..... 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.

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

If allowed to penetrate the skin, **lambda-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.

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 carbon monoxide, carbon dioxide, hydrogen chloride, hydrogen fluoride, nitrogen oxides 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 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. Keep unprotected persons away from the spill area. Avoid and reduce vapour and mist formation as much as possible. Remove sources of ignition.

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, 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 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 25°C, which is 10°C below its flash point of approx. 35°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.

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.

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.

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

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.

Store 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 to be used for the formulation of registered pesticides which may only be used for the applications they are 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 .....

No exposure limit values have been established for the active ingredient **lambda-cyhalothrin**, but care must be taken to minimise inhalation. An internal value of 0.04 mg/m^3 (8-hr LTEL-TWA) is recommended by the manufacturer for lambda-cyhalothrin.

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.

Lambda-cyhalothrin

DNEL	0.00063 mg/kg bw/day
PNEC, aquatic environment	0.04 ng/l

Aromatic hydrocarbons

DNEL, dermal	25 mg/kg bw/day
DNEL, inhalation	151 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.

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 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	Yellow liquid
Odour	Of aromatic hydrocarbons
Odour threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Initial boiling point and boiling range	Not determined
	Aromatic hydrocarbons : 155 - 181°C
Flash point	> 35°C
Evaporation rate	Not determined
	Aromatic hydrocarbons : 0.15 (butyl acetate = 1)
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	**Lambda-cyhalothrin** : 2 x 10^{-7} Pa at 20°C (by extrapolation) 2 x 10^{-4} Pa at 60°C 8 x 10^{-4} Pa at 70°C
	Aromatic hydrocarbons : 0.20 kPa at 20°C 0.71 kPa at 38°C
Vapour density	**Aromatic hydrocarbons** : > 1 (air = 1)
Relative density	Not determined

Solubility(ies)	Solubility of **lambda-cyhalothrin** at 21°C in:	
	hexane	> 500 g/l
	toluene	> 500 g/l
	ethyl acetate	> 500 g/l
	water	0.005 mg/l at 20°C and pH 6.5
Partition coefficient n-octanol/water	**Lambda-cyhalothrin**	: log K_{ow} = 7
	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	
Viscosity	Not determined	
Explosive properties.....	Not explosive	
Oxidising properties	Not oxidising	

9.2. **Other information** ..... Not available

SECTION 10: STABILITY AND REACTIVITY

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

10.2. **Chemical stability** ..... Lambda-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.

Product

Acute toxicity	The product is toxic by ingestion and inhalation. The acute toxicity is estimated as:	
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 50 - 200 mg/kg
	- skin	LD_{50}, dermal, rat: 1000 - 2000 mg/kg
	- inhalation	LC_{50}, inhalation, rat: 0.05 - 0.2 mg/l/4 h
Skin corrosion/irritation	Not expected to be irritating to skin. * Can cause skin dryness.	
Serious eye damage/irritation	Not expected to be irritating to eyes. *	
Respiratory or skin sensitisation ...	Not expected to be sensitising to skin. *	
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		Can cause irritation of airways.
STOT – repeated exposure		The following has been measured on the active ingredient lambda-cyhalothrin: Target organ: nervous system. NOEL: approx. 0.7 mg/kg bw/day in a 90-day rat study based on increased liver weight and changes of hepatic chemistry.
Aspiration hazard		The product presents an aspiration pneumonia hazard.
Symptoms and effects, acute and delayed		On contact, lambda-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.
Lambda-cyhalothrin		
Toxicokinetics, metabolism and distribution		Lambda-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		Lambda-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): 79 mg/kg (method OECD 401)
		LD_{50}, oral, rat (female): 56 mg/kg
	- skin	LD_{50}, dermal, rat (male): 632 mg/kg (method OECD 402)
		LD_{50}, dermal, rat (female): 696 mg/kg
	- inhalation	LC_{50}, inhalation, rat: 0.06 mg/l/4 h (method OECD 403)
Skin corrosion/irritation		Not irritating to skin (method OECD 404). *
Serious eye damage/irritation		Mildly irritating to eyes (method OECD 405). *
Respiratory or skin sensitisation ...		Not a skin sensitizer (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).

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.

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 macro-organisms and birds.

The ecotoxicity measured on the active ingredient lambda-cyhalothrin is:

- Fish	Rainbow trout (*Salmo gairdneri*)	96-h LC_{50}: 0.24 µg/l
	Sheepshead minnow (*Cyprinodon variegatus*)	28-day NOEC: 0.25 µg/l
- Invertebrates	Daphnids (*Daphnia magna*)	48-h LC_{50}: 0.36 µg/l 21-day NOEC: 2.0 ng/l
- Algae	Green algae (*Selenastrum capricornutum*)	96-h EC_{50}: > 0.3 mg/l
- Earthworms	*Eisenia foetida*	14-day LC_{50}: > 1000 mg/kg soil
- Birds	Mallard duck (*Anas platyrhynchos*)	LD_{50}: > 3950 mg/kg
- Insects	Bees (*Apis mellifera*)	48-h LC_{50}, contact: 38 ng/bee 48-h LC_{50}, oral: 909 ng/bee

12.2. **Persistence and degradability** .... **Lambda-cyhalothrin** is not readily biodegradable. Its primary half-life in soil is measured to be approx. 30 to 100 days 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.

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

Lambda-cyhalothrin has the potential to bioaccumulate. However, the risk of bioaccumulation is low, because the substance has a very low solubility in water and is rapidly removed from the water phase. Therefore, bioavailability is low. Moreover, 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** ..... **Lambda-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 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. 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** 3351

14.2. **UN proper shipping name** ..... Pyrethroid pesticide, liquid, toxic, flammable (lambda-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.

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

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.

SECTION 16: OTHER INFORMATION

List of abbreviations .....

ACGIH	American Conference of Governmental Industrial Hygienists
BOD_5	Biological Oxygen Demand within 5 days
CAS	Chemical Abstracts Service
COD	Chemical Oxygen Demand
CS	Capsule Suspension
Dir.	Directive
DNEL	Derived No Effect Level
EC	European Community
EC_{50}	50% Effect Concentration
EINECS	European INventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
IBC	International Bulk Chemical code
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose
LTEL	Long-term exposure limit
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
OECD	Organisation for Economic Cooperation and Development
PBT	Persistent, Bioaccumulative, Toxic
PNEC	Predicted No Effect Concentration
Reg.	Registration, or Regulation
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value

TWA	Time Weighted Average
vPvB	very Persistent, very Bioaccumulative
WHO	World Health Organisation

References ..... Data on ingredients are available from published literature and can be found several places.

Method for classification ..... Calculation rules

Used hazard statements .....

H226	Flammable liquid and vapour.
H301	Toxic if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
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.
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 FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

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