FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

SAFETY DATA SHEET

ABAMECTIN 36 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** .....

Abamectin 36 g/l EC
Contains avermectin B1a, N-methyl-2-pyrrolidone, hexan-1-ol

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**

FMC Agricultural Solutions A/S
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
England and Wales: 111
Estonia: +372 7943500
Finland: +358 9 471 977
France: +33 (0) 1 45 42 59 59
Greece: 30 210 77 93 777
Hungary: +36 80 20 11 99
Ireland (Republic): +353 1 837 9964
Italy: +39 02 6610 1029
Latvia: +371 670 42 473
112
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: 800 250 250 (in Portugal only)
+351 21 330 3284
Romania: +40 21318 3606
Scotland: +8454 24 24 24
Slovakia: +421 2 54 77 4 166
Slovenia: +386 41 650 500
South Africa: +27 83 123 3911 (Bateleur Emergency Response Co.)
Spain: +34 91 562 04 20
Sweden: +46 08-331231
112
Switzerland: 145
Turkey: 114
U.S.A. & Canada: +1 800 / 331 3148
All other countries: +1 651 / 632 6793 (Collect)

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Thyborønvej 78
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+45 9690 9690
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For fire, leak, spill or other accident emergencies:

U.S.A.: +1 800 / 424 9300 (CHEMTREC)
All other countries: +1 703 / 741 5970 (CHEMTREC - Collect)

SECTION 2: HAZARDS IDENTIFICATION

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

Acute oral toxicity: Category 4 (H302)
Toxic to reproduction: Category 1B (H360D)
Specific target organ toxicity - single exposure: Category 3 (H335)
Specific target organ toxicity - repeated exposure: Category 2 (H373)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

WHO classification ..... Class II: Moderately hazardous

Health hazards ..... The solvent N-methyl-2-pyrrolidone may cause malformations in offspring. The active ingredient abamectin is suspected to cause birth defects as well.

The product is harmful by ingestion. On prolonged exposure it can cause several serious effects. See section 11.

Abamectin is a dangerous poison if swallowed or inhaled. It is harmful in contact with skin. Inhalation of aerosol or spray mist is hazardous as well.

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

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... Abamectin 36 g/l EC
Contains avermectin B1a, N-methyl-2-pyrrolidone, hexan-1-ol

Hazard pictograms (GHS07, GHS08, GHS09)

Signal word ..... Danger

Hazard statements

H302 ..... Harmful if swallowed.
H335 ..... May cause respiratory irritation.
H360D ..... May damage the unborn child.
H373 ..... May cause damage to nervous system through prolonged or repeated exposure.
H410 ..... Very toxic to aquatic life with long lasting effects.

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

Precautionary statements
P261 ..... Avoid breathing vapours.
P264 ..... Wash hands thoroughly after handling.
P280 ..... Wear protective gloves, protective clothing and eye protection.
P304+P340 ..... IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
P312 ..... Call a POISON CENTER or physician if you feel unwell.
P501 ..... Dispose of contents and 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.

Abamectin ..... Content: 4% w/w
CAS name ..... Avermectin A1a, 5-O-demethyl-
CAS no. 65195-55-3
IUPAC name ..... (10*E*,14*E*,16*E*,22*Z*)-(1*R*,4*S*,5′*S*,6*S*,6′*R*,8*R*,12*S*,13*S*,20*R*,21*R*,24*S*)-= 6′-[(*S*)-*sec*-butyl]-21,24-dihydroxy-5′,11,13,22-tetramethyl-2-oxo-= 3,7,19-trioxatetracyclo[15.6.1.1^{4,8}.0^{20,24}]pentacosa-10,14,16,22-= tetraene-6-spiro-2′-(5′,6′-dihydro-2′*H*-pyran)-12-yl 2,6-dideoxy-4-= *O*-(2,6-dideoxy-3-*O*-methyl-α-L-*arabino*-hexopyranosyl)-3-*O*-= methyl-α-L-*arabino*-hexopyranoside
EC no. (EINECS no.) 265-610-3
EU index no. 606-143-00-0
Molecular weight 873.07
Classification of the ingredient ..... Acute oral toxicity: Category 2 (H300)
Acute inhalation toxicity: Category 1 (H330)
Toxic to reproduction: Category 2 (H361d)
Specific target organ toxicity - repeated exposure: Category 1 (H372)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

Reportable ingredients	Content (% w/w)	CAS no.	EC no. (EINECS no.)	Classification
N-Methyl-2-pyrrolidone Reg. no. 01-2119472430-46	26	872-50-4	212-828-1	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Rep. Tox. 1B (H360D) STOT SE 3 (H335)
Hexan-1-ol Reg. no. 01-2119487976-12	26	111-27-3	203-852-3	Acute Tox. 4 (H302)

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Paraffins (petroleum), normal C5-20	5	64771-72-8	265-233-4	Asp. Tox. 1 (H304)
Calcium dodecylbenzenesulphonate	1	26264-06-2	247-557-8	Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Aquatic Chronic 2 (H411)
2,6-Di-*tert*-butyl-*p*-cresol	1	128-37-0	204-881-4	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

In case of exposure, do not wait for symptoms to develop. Immediately start the recommended procedures below.

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.

Skin contact .....

Clothing contaminated with material must be removed immediately and all skin washed thoroughly with water and soap. Get medical attention if symptoms develop.

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 if irritation develops.

Ingestion .....

Call a doctor or get medical attention immediately. Make the exposed person rinse mouth and then drink 1 or 2 glasses of water or milk. 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

Exposure may cause symptoms of nervous system depression. High doses cause death by respiratory failure.

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 an insecticide. Describe his/her condition and the extent of exposure. Immediately remove the exposed person from the area where the product is present. Perform artificial respiration if needed.

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

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Notes to physician ..... Abamectin acts as agonist of the GABA (gamma-aminobutyric acid) neurotransmitter in nerve cells.

A specific antidote for exposure to this material is not known. Gastric lavage and/or the administration of activated charcoal can be considered. After decontamination, treatment should be directed at the control of symptoms and the clinical condition.

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 carbon monoxide, carbon dioxide, nitrogen oxides and sulphur dioxide.

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 predetermined plan for the handling of spills. 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 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.

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6.3. **Methods and materials for containment and cleaning up**

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

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

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

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

SECTION 7: HANDLING AND STORAGE

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

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

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

Keep all unprotected persons and children away from working area.

Persons working with this material for a longer period should be careful to minimise exposure. See section 11. Pregnant women must avoid all work with the product, because it may damage the unborn child.

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

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

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**

Storage at temperatures not exceeding 35°C is recommended.

Keep in closed, labelled containers in the dark. Protect against strong heat from sunshine or other source.

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 not established for abamectin. An internal value of 0.02 mg abamectin/m^3 is recommended by the manufacturer.

		Year	
N-Methyl-2-pyrrolidone	ACGIH (USA) TLV	2015	Not established
	OSHA (USA) PEL	2015	Not established
	EU, 2000/39/EC as amended	2017	Not established
	Germany, MAK	2014	TWA 20 ppm (82 mg/m^3), vapour Peak level 40 ppm (164 mg/m^3), vapour Skin notation; BAT
	HSE (UK) WEL	2011	8-hr TWA: 10 ppm (40 mg/m^3) STEL: 20 ppm (80 mg/m^3) Skin notation

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

Abamectin

DNEL ..... Not established
The EFSA has established an AOEL of 0.0025 mg/kg bw/day

PNEC, aquatic environment ..... 0.35 ng/l

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N-Methyl-2-pyrrolidone

DNEL, inhalation	14.4 mg/m^3
DNEL, dermal	4.8 mg/kg bw/day
PNEC, fresh water	0.25 mg/l
PNEC, marine water	0.025 mg/l

8.2. **Exposure controls** .....

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

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 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 frequently. Be careful not to touch anything with contaminated gloves. Used gloves should be thrown out and not be reused.

To avoid spreading of chemicals, it may be useful to have an appointment for the workplace where gloves may be worn and especially where gloves may not be worn.

Eye protection .....

Wear safety glasses or face shield. It is recommended to have an eye wash fountain immediately available in the workplace when there is a potential for eye contact.

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

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Thyborønvej 78
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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	Amine odour
Odour threshold	Not determined
pH	7.12 at 20°C
Melting point/freezing point	Not determined Crystallisation point: approx. 0°C
Initial boiling point and boiling range	Not determined **Abamectin** : decomposes **N-Methyl-2-pyrrolidone** : 202°C **Hexan-1-ol** : 157°C
Flash point	73°C (Pensky-Martens closed tester)
Evaporation rate	Not determined
Flammability (solid/gas)	Not applicable (liquid)
Upper/lower flammability or explosive limits	**N-Methyl-2-pyrrolidone** : 1.3 - 9.5 vol% (≈ 1.3 - 9.5 kPa) **Hexan-1-ol** : 1.2 - 7.7 vol% (≈ 1.2 - 7.7 kPa)
Vapour pressure	**Abamectin** : < 1.0 x 10^{-5} Pa at 25°C **N-Methyl-2-pyrrolidone** : 40 Pa at 20°C **Hexan-1-ol** : 93 Pa at 20°C
Vapour density	Not determined
Relative density	Not determined Density: 0.966 g/ml at 20°C
Solubility(ies)	Solubility of **abamectin** at 25°C in: octanol 74.3 g/l methanol 12.1 g/l hexanes 0.00443 g/l water 0.00054 g/l (at 20°C)
Partition coefficient n-octanol/water	**Abamectin** : log K_{ow} = 5.5 **N-Methyl-2-pyrrolidone** : log K_{ow} = -0.46 **Hexan-1-ol** : log K_{ow} = 2.02
Autoignition temperature	**N-Methyl-2-pyrrolidone** : 270°C **Hexan-1-ol** : 285°C
Decomposition temperature	Decomposition of abamectin starts at 60°C.
Viscosity	23.5 mPa.s at 20°C
Explosive properties	Not explosive
Oxidising properties	Not oxidising

9.2. **Other information**

Miscibility	The product is dispersible in water.

SECTION 10: STABILITY AND REACTIVITY

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

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10.2. **Chemical stability** ..... The product is stable during normal handling and storage at ambient temperatures.

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 harmful if swallowed. It is not classified as harmful by inhalation or by skin contact, but harmful effects can occur by these routes as well. The acute toxicity of the product is measured as:

Route(s) of entry	- ingestion	LD_{50}, oral, rat: 400 mg/kg (method OECD 425)
	- skin	LD_{50}, dermal, rat: > 4000 mg/kg (method OECD 402) *
	- inhalation	LC_{50}, inhalation, rat: > 4.96 mg/l/4 h signs of toxicity at this concentration (method OECD 403)

Skin corrosion/irritation ..... Not irritating to skin (method OECD 404). *

Serious eye damage/irritation ..... Minimally irritating to eyes (method OECD 405). *

Respiratory or skin sensitisation ... Not a skin sensitizer (method OECD 406). *

Germ cell mutagenicity ..... The product contains no ingredients known to be mutagenic. *

Carcinogenicity ..... The product contains no ingredients known to be carcinogenic. *

Reproductive toxicity ..... NOAEL for fertility and systemic toxicity of N-methyl-2-pyrrolidone was 350 mg/kg bw/day. The NOAEL for developmental toxicity was 160 mg/kg bw/day in two-generation reproduction studies with rats (method OECD 416).

NOAELs for maternal toxicity and developmental toxicity are somewhat uncertain, but both appear to be approx. 125 - 250 mg/kg bw/day in an oral developmental toxicity study with rats during gestation days 6 through 20 (method OECD 414).

NOAEC for maternal toxicity of N-methyl-2-pyrrolidone was 30 ppm (0.123 mg/l), NOAEC for developmental toxicity was 60 ppm (0.247 mg/l), NOAEC for teratogenicity was 120 ppm (0.494 mg/l) in a developmental inhalation toxicity study with rats during gestation days 6 through 20 for 6 h/day (method OECD 414).

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		Reduced mating results and birth defects were observed in animal tests with **abamectin** at maternal toxic doses (3 studies).
STOT – single exposure		To our knowledge, no specific effects have been observed after single exposure. *
STOT – repeated exposure		The following was measured on the active ingredient **abamectin**: Target organ: primarily nervous system Abamectin has neurotoxic effects at prolonged exposure. In animal studies apathy and general bad condition were noted at dose levels of around 10 mg abamectin/kg bw/day. LOEL, oral: 0.5 mg/kg bw/day in an 18-week dog study (method OECD 409) LOAEC, inhalation: 0.0027 mg/l in a 30-day rat study (6 hrs/day).
Aspiration hazard		The product does not contain ingredients known to present an aspiration pneumonia hazard. *
Symptoms and effects, acute and delayed		Exposure causes symptoms of nervous system depression, such as pupil dilation, vomiting, excitation, incoordination, tremors, lethargy, coma. High doses cause death by respiratory failure.
Abamectin		
Toxicokinetics, metabolism and distribution		Abamectin is rapidly absorbed and excreted with half-live times of one to two days. It is extensively metabolised. Bioaccumulation is not likely. Abamectin and its metabolites are found throughout all organs.
Acute toxicity		The substance is very toxic if swallowed and by inhalation. It is less toxic by skin contact. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 8.2 mg/kg (method OECD 401)
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg (method OECD 402) *
	- inhalation	LC_{50}, inhalation, rat: 0.031 - 0.051 mg/l/4 h (method OECD 403)
Skin corrosion/irritation		Not irritating to skin (method similar to OECD 404). *
Serious eye damage/irritation		Not irritating to eyes (method OECD 405). *
Respiratory or skin sensitisation ...		Not a skin sensitizer (method OECD 406). *
N-Methyl-2-pyrrolidone		
Toxicokinetics, metabolism and distribution		After oral exposure, N-methyl-2-pyrrolidone is rapidly absorbed. It is metabolised and eliminated mainly in the urine with elimination half-lives of 1 to 2.5 hours and negligible tissue residues 5 days post dose. There is no potential for bioaccumulation.
Acute toxicity		The substance is not considered as harmful by inhalation, ingestion or skin contact. * The acute toxicity is measured as:

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Route(s) of entry	- ingestion	LD_{50}, oral, rat: 4150 mg/kg (method OECD 401)
	- skin	LD_{50}, dermal, rat: > 5000 mg/kg (method OECD 402)
	- inhalation	LC_{50}, inhalation, rat: > 5.1 mg/l/4 h (method OECD 403)
Skin corrosion/irritation		Slightly irritating to skin (method OECD 404). *
Serious eye damage/irritation		Moderately irritating to eyes (method OECD 405).
Respiratory or skin sensitisation ...		To our knowledge, allergenic effects have not been reported. *

Hexan-1-ol

Acute toxicity		The substance is harmful by ingestion. It is not considered as harmful by inhalation or skin contact. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 200 - 2000 mg/kg (method OECD 401). Various numbers are quoted in literature.
	- skin	LD_{50}, dermal, rabbit: > 2000 mg/kg (method OECD 402) *
	- inhalation	LC_{50}, inhalation, rat: > 21 mg/l/1 h *
Skin corrosion/irritation		Slightly irritating to skin (method OECD 404). *
Serious eye damage/irritation		Slightly irritating to eyes (method OECD 405). Various study results are quoted in literature. *
Respiratory or skin sensitisation ...		Not sensitising to skin (method OECD 406). *

Paraffins (petroleum), normal C5-20

Acute toxicity		The substance is not considered as harmful by ingestion, inhalation or skin contact. *
Skin corrosion/irritation		Not irritating to skin. *
Serious eye damage/irritation		Moderately irritating to eyes. *
Respiratory or skin sensitisation ...		Not sensitising to skin. *
Aspiration hazard		The product presents an aspiration pneumonia 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.

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

2,6-Di-tert-butyl-p-cresol

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

Route(s) of entry	- ingestion	LD_{50}, oral, rat: > 2930 mg/kg (method OECD 401)
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg (method OECD 402)
	- inhalation	LC_{50}, inhalation, rat: not accessible

Skin corrosion/irritation ..... Not irritating to skin (method OECD 404). *

Serious eye damage/irritation ..... Not irritating to eyes (method OECD 405). *

Respiratory or skin sensitisation ... Negative in human patch test. *

SECTION 12: ECOLOGICAL INFORMATION

12.1. **Toxicity** ..... The product is highly toxic to aquatic invertebrates, aquatic life stages of amphibians and insects. It is very toxic to fish and harmful to aquatic plants. It is not considered as harmful to birds and soil macro- and microorganisms.

The ecotoxicity as measured on the product is:

- Fish	Zebrafish (*Danio rerio*)	96-h LC_{50}: 0.40 mg/l
- Invertebrates	Daphnids (*Daphnia magna*)	48-h EC_{50}: 5.58 µg/l
- Algae	Green algae (*Selenastrum capricornutum*)	72-h IC_{50}: 41.43 mg/l
- Birds	Japanese quail (*Coturnix coturnix japonica*)	LD_{50}: > 2000 mg/kg
- Earthworms	*Eisenia foetida*	14-day LC_{50}: 1250 mg/kg dry soil
- Insects	Honey bees (*Apis mellifera*)	48-h LC_{50}, contact: 0.15 µg/bee

12.2. **Persistence and degradability** .... **Abamectin** is not readily biodegradable. However, it undergoes degradation in the environment and in waste water treatment plants. Primary degradation half-lives vary with circumstances from 14 to 20 days in different soil types. Abamectin is degraded photochemically in soil and water as well.

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.

Abamectin is not expected to bioaccumulate. The Bioconcentration Factor (BCF) was measured to be 54 in zebrafish (*Danio rerio*; whole fish).

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

12.4. **Mobility in soil** ..... **Abamectin** is mobile in soil.

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

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

SECTION 13: DISPOSAL CONSIDERATIONS

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

Disposal of waste and 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 possible, 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** 3082

14.2. **UN proper shipping name** ..... Environmentally hazardous substance, liquid, n.o.s. (abamectin)

14.3. **Transport hazard class(es)** 9

FMC Agricultural Solutions A/S
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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 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.

The employer shall assess any risks to the safety or health and any possible effect on the pregnancies or breastfeeding of workers and decide what measures should be taken (Dir. 92/85/EEC).

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 .....

AOEL	Acceptable Operator Exposure Level
ACGIH	American Conference of Governmental Industrial Hygienists
BAT	Biologische Arbeitsstoff-Toleranzwerte
CAS	Chemical Abstracts Service
Dir.	Directive
DNEL	Derived No Effect Level
EC	Emulsifiable Concentrate, or European Community
EC_{50}	50% Effect Concentration
EFSA	European Food Safety Authority
EINECS	European INventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
HSE	Health and Safety Executive (UK)
IBC	International Bulk Chemical code

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IC_{50}	50% Inhibition Concentration
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose
LOAEC	Lowest Observed Adverse Effect Concentration
LOEL	Lowest Observed Effect Level
MAK	Maximale Arbeitsplatz-Konzentration
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
n.o.s.	Not otherwise specified
OECD	Organisation for Economic Cooperation and Development
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 Weighted 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 ..... Acute oral toxicity: test data
Toxic to reproduction: calculation rules
Specific target organ toxicity - single exposure: calculation rules
Specific target organ toxicity - repeated exposure: calculation rules
Hazards to the aquatic environment, acute: test data
chronic: calculation rules

Used hazard statements .....

H300	Fatal if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H360D	May damage the unborn child.
H361d	Suspected of damaging the unborn child.
H372	Causes damage to nervous system through prolonged or repeated exposure.

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H373	May cause 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.
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.

Prepared by: FMC Agricultural Solutions A/S / GHB