Cheminova A/S
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www.fmc.com
CVR No. DK 12 76 00 43

SAFETY DATA SHEET

1341-02

(Flutriafol 37.5 g/l + Thiabendazole 25 g/l + Imazalil 15 g/l SC)

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** ..... **1341-02 (Flutriafol 37.5 g/l + Thiabendazole 25 g/l + Imazalil 15 g/l SC)**

1.2. **Relevant identified uses of the substance or mixture and uses advised against** ..... Can be used as fungicide only.

1.3. **Details of the supplier of the safety data sheet**

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DK-7673 Harboøre
Denmark
SDS.Ronland@fmc.com

1.4. **Emergency telephone number**
Company ..... (+45) 97 83 53 53 (24 h; for emergencies only)

Medical emergencies:
Austria: +43 1 406 43 43
Belgium: +32 70 245 245
Bulgaria: +359 2 9154 409
Cyprus: 1401
Czech Republic: +420 224 919 293
+420 224 915 402
Denmark: +45 82 12 12 12
France: +33 (0) 1 45 42 59 59
Finland: +358 9 471 977
Greece: 30 210 77 93 777
Hungary: +36 80 20 11 99
Ireland (Republic): +352 1 809 2166
Italy: +39 02 6610 1029
Lithuania: +370 523 62052
+370 687 53378
Luxembourg: +352 8002 5500
Netherlands: +31 30 274 88 88
Norway: +47 22 591300
Poland: +48 22 619 66 54
+48 22 619 08 97
Portugal: 808 250 143 (in Portugal only)
+351 21 330 3284
Romania: +40 21318 3606
Slovakia: +421 2 54 77 4 166
Slovenia: +386 41 650 500
Spain: +34 91 562 04 20
Sweden: +46 08-331231
112
Switzerland: 145
United Kingdom: 0870 600 6266 (in the UK only)
U.S.A. & Canada: +1 800 / 331-3148 (PROSAR)
All other countries: +1 651 / 632-6793 (PROSAR - Collect)

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SECTION 2: HAZARDS IDENTIFICATION

2.1. **Classification of the substance or mixture** ..... Hazards to the aquatic environment, chronic: Category 2 (H411)

WHO classification ..... Class U (Unlikely to present acute hazard in normal use)

Health hazards ..... The active ingredient flutriafol is harmful by ingestion. The active ingredient imazalil is harmful by ingestion and inhalation.

The colourant in this product is suspected of causing cancer.

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

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... 1341-02 (Flutriafol 37.5 g/l + Thiabendazole 25 g/l + Imazalil 15 g/l SC)

Hazard pictogram (GHS09) .....

Signal word ..... None

Hazard statement
H411 ..... Toxic to aquatic life with long lasting effects.

Supplementary hazard statements
EUH208 ..... Contains 1,2-benzisothiazol-3(2H)-one. May produce an allergic reaction.
EUH401 ..... To avoid risks to human health and the environment, comply with the instructions of use.

Precautionary statements
P273 ..... Avoid release to the environment.
P391 ..... Collect spillage.
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.

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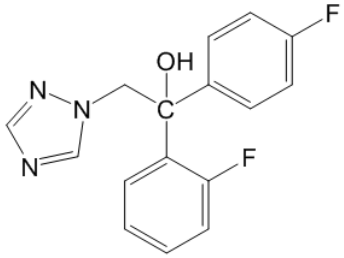
Active ingredients

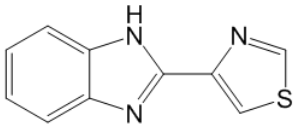
Flutriafol ..... Content: 3.5% by weight
CAS name ..... 1H-1,2,4-Triazole-1-ethanol, α-(2-fluorophenyl)-α-(4-fluorophenyl)-
CAS no. 76674-21-0
IUPAC name ..... (RS)-2,4′-Difluoro-α-(1H-1,2,4-triazol-1-ylmethyl)benzhydryl alcohol
ISO name ..... Flutriafol
EC no. (EINECS no.) ..... None
EU index no. ..... None
Classification of the ingredient ..... Acute oral toxicity: Category 4 (H302)
Hazards to the aquatic environment, chronic: Category 2 (H411)

Structural formula .....



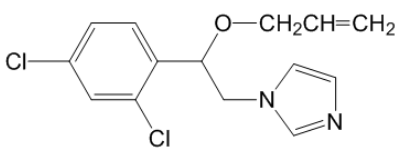
Thiabendazole ..... Content: 2.4% by weight
CAS name ..... 1H-Benzimidazole, 2-(4-thiazolyl)-
CAS no. 148-79-8
IUPAC name ..... 2-(1,3-Thiazol-4-yl)benzimidazole
ISO name/EU name ..... Thiabendazole
EC no. (EINECS no.) 205-725-8
EU index no. 613-054-00-0
Classification of the ingredient ..... Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

Structural formula .....



Imazalil ..... Content: 1.4% by weight
CAS name ..... 1H-Imidazole, 1-[2-(2,4-dichlorophenyl)-2-(2-propenyloxy)ethyl]-
CAS no. 35554-44-0
IUPAC name(s) ..... (±)-1-(β-Allyloxy-2,4-dichlorophenylethyl)imidazole
ISO name/EU name ..... Imazalil
EC no. (EINECS no.) 252-615-0
EU index no. 613-042-00-5
Classification of the ingredient ..... Acute oral toxicity: Category 3 (H301)
Acute inhalation toxicity: Category 4 (H332)
Eye damage: Category 1 (H318)
Hazards to the aquatic environment, acute: Category 1 (H400)
chronic: Category 1 (H410)

Structural formula .....



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Reportable ingredients	Content (% w/w)	CAS no.	EC no. (EINECS no.)	Classification
Propane-1,2-diol Reg. no. 01-2119456809-23	24	57-55-6	200-338-0	None
Disodium 5-acetyl-amino-4-hydroxy-3-(phenylazo)naphthalene-2,7-disulphonate	3	3734-67-6	223-098-9	None
1,2-Benzisothiazol-3(2H)-one	0.03	2634-33-5	220-120-9	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Skin Sens. 1A (H317) Aquatic Acute 1 (H400)

SECTION 4: FIRST AID MEASURES

4.1. **Description of first aid measures**

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 ..... Immediately remove contaminated clothing and footwear. Flush skin with water. Wash with water and soap. See physician if any symptom develops.

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 persists.

Ingestion ..... Let the exposed person rinse mouth and let him/her drink several glasses of water or milk, but not induce vomiting. If vomiting does occur, let him/her rinse mouth and drink fluids again. Get medical attention immediately.

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

When fed to animals at high dosage, more concentrated formulations of flutriafol caused salivation, depression of activity, muscle spasms, ataxia and increased body temperature.

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

Immediate medical attention is required in case of ingestion

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

Note to physician ..... A specific antidote against this substance is not known. Treatment is as for a general chemical. Gastric lavage and/or administration of activated charcoal can be considered.

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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 hydrogen fluoride, hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, sulphur dioxide and various fluorinated and chlorinated 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.

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, closable vessels for the collection of spills should be available.

In case of large spill (involving 10 tonnes of the product or more):
1. use personal protection equipment; see section 8
2. call emergency telephone no.; see section 1
3. alert authorities.

Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and rubber boots.

Stop the source of the spill immediately if safe to do so. 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).

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.

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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 recommended 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.

Keep treated seed separate from other grain and store as hazardous material if not used immediately. Contamination of grain intended for human or animal consumption MUST be avoided.

Do not feed treated seed to wild or domestic birds or poultry. Any spillages of treated seed, however minor, must be cleaned up immediately. If disposal is required, ensure treated seed is thoroughly buried and not accessible to birds and other wildlife.

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 25°C is recommended. Protect from frost, fire and heat.

Keep in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with

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impermeable floor, without access of unauthorised persons or children. 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	
Flutriafol		2015	Not established. An internal PEL of 1.5 mg/m^3 (8-hr TWA) is recommended by the manufacturer.
Thiabendazole		2015	Not established. An internal PEL of 5 mg/m^3 (8-hr TWA) is recommended by the manufacturer.
Imazalil		2015	Not established. An internal PEL of 0.125 mg/m^3 (8-hr TWA) is recommended by the manufacturer.
Propane-1,2-diol	AIHA (USA) WEEL	2015	10 mg/m^3
	MAK (Germany)	2014	Cannot be established at present
	HSE (UK) WEL	2011	8-hr TWA 150 ppm (474 mg/m^3) total (vapour and particulates) 10 mg/m^3 (particulates)

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

Flutriafol

DNEL	0.05 mg/kg bw/day
PNEC, aquatic environment	6.2 µg/l

Thiabendazole

DNEL	0.1 mg/kg bw/day
PNEC, aquatic environment	0.84 µg/l

Imazalil

DNEL	0.05 mg/kg bw/day
PNEC, aquatic	1.2 µg/l

Propane-1,2-diol

DNEL, inhalation, systemic	183 mg/m^3
DNEL, inhalation, local	10 mg/m^3
PNEC, fresh water	260 mg/l
PNEC, marine water	26 mg/l

8.2. **Exposure controls** ..... When used in a closed system, personal protection equipment will not

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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 use solution, but can be recommended for final use as well.

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

Respiratory protection

The product does not automatically present an airborne exposure concern during normal handling, but 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 heavy duty natural rubber gloves. The breakthrough time of these gloves for the product is unknown, but it is expected that they will give adequate protection if the work done manually is kept limited.

Eye protection .....

Wear safety glasses. 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 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	Red liquid (suspension in water)
Odour	No clear odour
Odour threshold	Not determined
pH	7.8
Melting point/freezing point	< 0°C
Initial boiling point and boiling range	> 100°C
Flash point	> 100°C if any (Pensky-Martens closed cup)
Evaporation rate	Not determined
Flammability (solid/gas)	Not applicable (liquid)

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Upper/lower flammability or explosive limits	Not determined
Vapour pressure	**Flutriafol** : 7.1×10^{-9} Pa at 20°C **Thiabendazole** : 5.3×10^{-7} Pa at 25°C **Imazalil** : 1.58×10^{-4} Pa at 25°C
Vapour density	Not determined
Relative density	Not determined Density: 1.06 g/ml
Solubility(ies)	Solubility of **flutriafol** at 21°C in: acetone 114 - 133 g/l n-heptane < 10 g/l water 130 mg/l at 20°C **Thiabendazole** : soluble in acetone and methanol, slightly soluble in 1,2-dichloroethane and xylene solubility in water: 50 mg/l at 25°C Solubility of **imazalil** at 20°C in: ethanol, isopropanol, acetone, ethyl acetate, diethyl ether, toluene, propylene glycol: all > 500 g/l n-heptane 19 g/l water 0.184 g/l at pH 7.6
Partition coefficient n-octanol/water	**Flutriafol** : log K_{ow} = 2.29 **Thiabendazole** : log K_{ow} = 2.47 **Imazalil** : log K_{ow} = 3.82 at 23°C
Autoignition temperature	None below 400°C
Decomposition temperature	Not determined
Viscosity	The product is a non-newtonian liquid. Viscosity is dependent on shear rate. 130 - 3200 mPa.s
Explosive properties.....	Not explosive
Oxidising properties	Not oxidising

9.2. **Other information**

Miscibility	The product is dispersible in water.

SECTION 10: STABILITY AND REACTIVITY

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

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Product

Acute toxicity		The product is not considered harmful by single exposure. * The acute toxicity is measured on the product as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: > 2000 mg/kg
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg
	- inhalation	LC_{50}, inhalation, rat: not available, but not expected to be harmful at maximally obtainable concentration in air.
Skin corrosion/irritation		Not irritating to skin. *
Serious eye damage/irritation		Mildly irritating to eyes. *
Respiratory or skin sensitisation ...		Not sensitising. *
Germ cell mutagenicity		The product contains no ingredient known to be mutagenic. *
Carcinogenicity		The product contains no ingredient known to be carcinogenic. *
Reproductive toxicity		The product contains no ingredient found to have adverse effects on reproduction. *
STOT – single exposure		To our knowledge, no specific effects have been observed after single exposure. *
STOT – repeated exposure		The following is found for the active ingredient flutriafol: Target organ: liver Repeated exposure to flutriafol may cause liver damage. The LOEL for this effect has been found to be approx. 150 mg flutriafol/kg bw/day in a 90-day feeding study in rats. *
Aspiration hazard		The product does not present an aspiration pneumonia hazard. *
Symptoms and effects, acute and delayed		To our knowledge, adverse effects in humans have not been reported. When fed to animals at high dosage, more concentrated formulations of flutriafol caused salivation, depression of activity, muscle spasms, ataxia and increased body temperature.

Flutriafol

Toxicokinetics, metabolism and distribution		Flutriafol is rapidly absorbed after oral intake. It is widely distributed in the body, but it preferably binds to red blood cells. Metabolism is almost complete. It is rapidly excreted. There is no evidence of accumulation.
Acute toxicity		The substance is harmful by ingestion. It is considered as less harmful by skin contact and by inhalation. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 300 - 2000 mg/kg (method OECD 423)

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	- skin	LD_{50}, dermal, rat: > 2000 mg/kg (method OECD 402) *
	- inhalation	LC_{50}, inhalation, rat: > 5.2 mg/l/4 h (method OECD 403) *
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 ...		Not sensitising (method OECD 429). *

Thiabendazole

Toxicokinetics, metabolism and distribution		Thiabendazole is rapidly absorbed after oral intake. It is widely distributed in the body. Metabolism is extensive. It is rapidly excreted. The potential for accumulation is low.
Acute toxicity		The substance is not considered as harmful. * The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat: 3100 mg/kg
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg
	- inhalation	LC_{50}, inhalation, rat: > 0.5 mg/l/4 h (maximum achieved concentration)
Skin corrosion/irritation		Not irritating to skin. *
Serious eye damage/irritation		Not irritating to eyes. *
Respiratory or skin sensitisation ...		Not sensitising (maximisation test). *

Imazalil

Toxicokinetics, metabolism and distribution		Imazalil is rapidly absorbed after oral intake. It is distributed to liver, kidney and intestine. Metabolism is almost complete. It is rapidly excreted. It has a no potential for accumulation.
Acute toxicity		The substance is harmful or toxic by ingestion and harmful by inhalation. It is not considered as harmful by skin contact. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD_{50}, oral, rat (male): 343 - 371 mg/kg
		LD_{50}, oral, rat (female): 227 - 309 mg/kg
	- skin	LD_{50}, dermal, rabbit: > 2000 mg/kg *
	- inhalation	LC_{50}, inhalation, rat (female): 1.84 mg/l/4 h
Skin corrosion/irritation		Not irritating to skin. *
Serious eye damage/irritation		Severely irritating to eyes.
Respiratory or skin sensitisation ...		Not a skin sensitizer. *

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Disodium 5-acetylamino-4-hydroxy-3-(phenylazo)naphthalene-2,7-disulphonate

Toxicokinetics, metabolism and distribution		After oral intake, the substance can be metabolised in the body. The main metabolite is aniline, which is primarily found in the blood. Aniline is further metabolised and its metabolites are excreted in the urine almost completely within 24 hours.
Acute toxicity		The substance is not harmful by single exposure. *
Route(s) of entry	- ingestion	LD_{50}, oral, rat: > 5000 mg/kg
	- skin	LD_{50}, dermal, rat: not available
	- inhalation	LC_{50}, inhalation, rat: not available
Skin corrosion/irritation		May be slightly irritating to skin. *
Serious eye damage/irritation		May be slightly irritating to eyes. *
Respiratory or skin sensitisation ...		To our knowledge, cases of sensitisation have not been reported. However, the chemical nature of the substance indicates it may have sensitising properties. *
Germ cell mutagenicity		Indications of possible mutagenic effects were observed in some bacterial tests. The majority of tests was negative. *
Carcinogenicity		There are concerns that the substance may cause cancer when converted to aniline.
STOT – repeated exposure		The substance may ultimately interfere with haemoglobin.

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

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

SECTION 12: ECOLOGICAL INFORMATION

12.1. **Toxicity** ..... The product is harmful to aquatic organisms. It may be harmful to

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insects. It is not considered as harmful to birds and soil macro- and microorganisms.

The acute toxicity of the active ingredients is measured as:

		Flutriafol	**Thiabendazole**	**Imazalil**
- Fish	Rainbow trout (*Salmo gairdneri*), 96 h-LC_{50}	61 mg/l	0.55 mg/l	1.48 mg/l
	28-day NOEC	6.2 mg/l	–	–
- Invertebrates	Daphnids (*Daphnia magna*), 48 h-EC_{50}	> 78 mg/l	0.81 mg/l	3.5 mg/l
	21-day NOEC	0.31 mg/l	0.042 mg/l	–
- Algae	*Selenastrum capricornutum*, 72 h-IC_{50}	–	–	0.87 mg/l
	Selenastrum capricornutum, 96 h-IC_{50}	12 mg/l	–	–
	Scenedesmus subspicatus, 72 h-IC_{50}	1.9 mg/l	–	–
- Earthworms	*Eisenia foetida foetida*, LD_{50}	180 days at 100 mg/m^2 No effects found	> 1000 mg/kg soil	–
- Birds	Japanese quail, LD_{50}	6350 mg/kg	–	510 mg/kg
	Bobwhite quail, LD_{50}	–	> 2250 mg/kg	–
	Mallard duck, LD_{50}	> 5000 mg/kg	–	250 mg/kg
- Bees	Honey bees (*Apis mellifera*), LD_{50}, contact	> 50 µg/bee	not toxic	35 µg/bee
	LD_{50}, oral	> 2 µg/bee	not toxic	39 µg/bee

12.2. **Persistence and degradability** ....

Flutriafol is not readily degradable. Primary degradation half-lives vary with circumstances, but are usually over 1 year in soil and water.

Thiabendazole degrades slowly under most circumstances.

Imazalil is biodegradable, but does not meet the criteria for being readily biodegradable. It undergoes degradation in the environment and in waste water treatment plants. Primary degradation half-lives vary with circumstances, but are usually around one week in aerobic soil and water.

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.

Bioaccumulation is not expected. The following bioconcentration factors (BCF) have been measured:

Flutriafol 7 (rainbow trout, *Oncorhynchus mykiss*)
Thiabendazole 87 (bluegill sunfish, *Lepomis macrochirus*)
Imazalil approx. 50 (rainbow trout, *Oncorhynchus mykiss*)

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

Flutriafol has moderate mobility in soil. Absorption depends on soil pH and organic matter content.

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Thiabendazole is not mobile in the environment, but binds strongly to soil.

Imazalil is of low mobility 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 feasible, the material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing.

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

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

♣ SECTION 14: TRANSPORT INFORMATION

ADR/RID/IMDG/IATA/ICAO classification

14.1. **UN number** 3082

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

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

14.4. **Packing group** III

14.5. **Environmental hazards** ..... Marine pollutant

14.6. **Special precautions for user** ..... Avoid any unnecessary contact with the product. Misuse can result in damage to health. Do not discharge to the environment.

14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code** ..... The product is not transported in bulk by ship.

SECTION 15: REGULATORY INFORMATION

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

Seveso category (Dir. 2012/18/EU): dangerous for the environment.

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).

Young people under the age of 18 are not allowed to work with the 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 .....

AIHA	American Industrial Hygiene Association
CAS	Chemical Abstracts Service
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
HSE	Health & Safety Executive, UK
IBC	International Bulk Chemical code
IC_{50}	50% Inhibition Concentration
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose

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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
OPPTS	Office of Prevention, Pesticides and Toxic Substances
PBT	Persistent, Bioaccumulative, Toxic
PEL	Personal Exposure Limit
PNEC	Predicted No Effect Concentration
Reg.	Registration, or Regulation
SC	Suspension Concentrate
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
TWA	Time Weighed Average
vPvB	very Persistent, very Bioaccumulative
WEEL	Workplace Environmental Exposure Level
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 ..... Calculation rules

Used hazard statements .....

H301	Toxic if swallowed.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
EUH208	Contains 1,2-benzisothiazol-3(2H)-one. 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 FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

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