

Product no. 13N/1350-03
Product name **FLUTRIAFOL 94 g/l + CARBENDAZIM 150 g/l SC**

GHB/May 2010
Replaces GHB/March 2009

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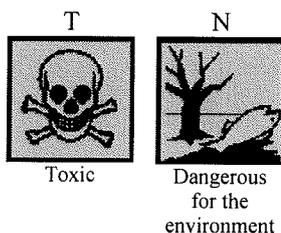
MILSTAR

SAFETY DATA SHEET

FLUTRIAFOL 94 g/l + CARBENDAZIM 150 g/l SC

Revision: Sections containing a revision or new information are marked with a ♣.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING



Product name **FLUTRIAFOL 94 g/l +
CARBENDAZIM 150 g/l SC**

Intended use Fungicide

Supplier **CHEMINOVA A/S**
P.O. Box 9
DK-7620 Lemvig
Denmark
sds@cheminova.dk

Phone (+45) 97 83 53 53 (24 h; for emergencies only)

2. ♣ HAZARDS IDENTIFICATION

- 2.1. EU classification of the product according to Dir. 1999/45/EC as amended T;Mut2;R46 Rep2;R60-61 N;R50/53; see 15.1.
- CLP classification Eye irritation: Category 2
according to Reg. 1272/2008 as amended Germ cell mutagenicity: Category 1B
Toxic to reproduction: Category 1B
Hazards to the aquatic environment: Acute and Chronic Category 1
- WHO classification None (Unlikely to present acute hazard in normal use)
- 2.2. Health hazards (acute and chronic) Animal tests have shown that carbendazim can cause chromosomal changes, reduced fertility, malformations of offspring and can cause liver tumours in mouse strains. Chronic exposure to flutriafol can cause liver damage.
- The acute toxicity of the product is low, but it may be slightly harmful by ingestion, by skin contact and by inhalation. The product is irritating to eyes and may be irritating to skin.
- 2.3. Signs and symptoms of exposure To our knowledge, adverse effects in humans have not been reported. When fed to animals at high dosage similar products caused non-specific symptoms of toxicity, such as changes of behaviour, decreased activity, lacrimation and incontinence.
- 2.4. Environmental hazards The product is very toxic to aquatic organisms.

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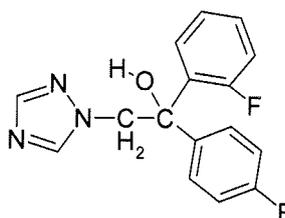
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3. ♣ COMPOSITION/INFORMATION ON INGREDIENTS

3.1. ACTIVE INGREDIENTS

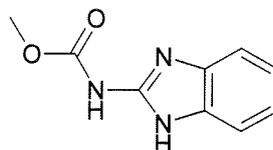
Flutriafol

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. (list no.) 616-367-0
EU index no. -
EU classification of the ingredient Xn;R22 N;R51/53; see section 16.
Structural formula



Carbendazim

CAS name Carbamic acid, 1H-benzimidazol-2-yl-, methyl ester
CAS no. 10605-21-7
IUPAC name Methyl benzimidazol-2-ylcarbamate
ISO name / EU name Carbendazim
EC no. (EINECS no.) 234-232-0
EU index no. 613-048-00-8
EU classification of the ingredient Mut2;R46 Rep2;R60-61 N;R50/53; see section 16.
Structural formula



3.2. COMPOSITION

Active ingredients	Carbendazim	14% by weight
	Flutriafol	9% by weight
Other ingredients	Emulsifier, water, etc.	77% by weight
Reportable ingredients	Alcohols, C13-15, ethoxylated	7% by weight
	CAS no. 64425-86-1	
	EU classification: Xn;R22 Xi;R41 N;R50; see section 16.	
	Propylene glycol	6% by weight
	CAS no.: 57-55-6, EC no. (EINECS no.): 200-338-0	
	EU classification: none	
	1,2-Benzisothiazol-3(2H)-one	max. 0.006% by weight
	CAS no.: 2634-33-5, EC no. (EINECS no.): 220-110-9	
	EU classification: Xn;R22 Xi;R38-41 R43 N;R50; see section 16.	

4. FIRST AID MEASURES

4.1. Emergency and first aid procedures In case of exposure, do not wait for symptoms to develop.

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Immediately start the recommended procedures below and in case of ingestion call a physician, poison centre or hospital immediately. Describe the type and extent of exposure and the victim's condition.

If in eyes: 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. Get medical attention if irritation persists.

If on skin: Immediately remove contaminated clothing and footwear and flush skin with much water, followed by washing with water and soap. Get medical attention if irritation or other symptoms develop.

If swallowed: Inducing vomiting is not recommended. Rinse mouth and drink a few glasses of water or milk. If vomiting does occur, rinse mouth and drink fluids again. Get medical attention immediately.

If inhaled: If experiencing any discomfort, remove the exposed person to fresh air and obtain medical advice.

4.2. Note to physician

There is no specific antidote for exposure to this material. Administration of activated charcoal or gastric lavage can be considered. After decontamination, treatment of exposure should be directed at the control of symptoms and the clinical condition.

5. ♣ FIRE-FIGHTING MEASURES

5.1. Extinguishing media and procedure

Dry chemical or carbon dioxide for small fires, water spray or foam for large fires.

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. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

5.2. Hazardous decomposition products in a fire

The essential breakdown products are: hydrogen fluoride, nitrogen oxides, carbon monoxide, carbon dioxide, sulphur dioxide and various fluorinated organic compounds.

5.3. Unusual fire and explosion hazards

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6. ♣ ACCIDENTAL RELEASE MEASURES

6.1. Personal protection

Observe all protection and safety precautions. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and boots when cleaning up spills. See section 8, Personal protection.

6.2. Steps to be taken in case of spill ...

It is recommended to have a predetermined plan for the handling of

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

Stop the source of the spill immediately if safe to do so. Contain the spill to prevent any further contamination of surface, soil or water. Avoid and reduce formation of vapour or mist as much as possible. Keep unprotected people away from the spill area.

6.3. Cleaning method

Spills on the floor or other impervious surface should be absorbed onto an absorptive material such as hydrated lime, universal binder, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Rinse area with much water and industrial detergent. Absorb wash liquid with suitable absorber and collect in suitable containers. Wash waters must be prevented from entering surface water drains.

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. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

6.4. Disposal

The used containers should be properly closed and labelled. Refer to section 13 for disposal.

7. HANDLING AND STORAGE

7.1. Precautions to be taken in handling

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

For its use as a pesticide, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8. The precautions of section 8 are primarily meant for handling of the undiluted product and for preparing the spray solution, but can be recommended for spraying as well.

7.2. Precautions to be taken in storing

Storage at temperatures not exceeding 25°C is recommended. Protect from frost.

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 be used for storage of chemicals only. Food, drink, feed and seed should not be present. A hand wash station should be available.

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- 7.3. Specific use 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.
- 7.4. Fire and explosion precautions Protect from exposure to fire and heat.

8. ♣ EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1. Exposure limits Not established for the active ingredients in this product. The following values for flutriafol and carbendazim are recommendations by the manufacturer:

Flutriafol	Internal value	TWA 1.5 mg/m ³
Carbendazim	Internal value	TWA 0.01 mg/m ³
Propylene glycol	AIHA (USA) WEEL	Year 2010 10 mg/m ³
	HSE (UK) WEL	2007 8-hr TWA 150 ppm (474 mg/m ³) total (vapour and particulates)
	MAK (Germany)	2009 Cannot be established at present

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

- 8.2. Personal protection 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.



Respiratory protection

In the event of a discharge of the material, workers should 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.

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.



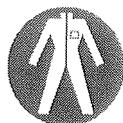
Eye protection

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.

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Other protection

Wear appropriate chemical resistant clothing and boots to avoid skin contact.

8.3. Work/hygienic practices

Persons working with this material for a longer period should be careful to minimise exposure. See 11.5. - 11.9. Pregnant women should not work with the product at all.

Keep all unprotected persons and children away from working area.

Avoid contact with eyes, skin or clothing. Avoid breathing vapour or mist.

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

8.4. Environmental exposure controls

Do not discharge to the environment. See section 13 for disposal.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Physical state	Liquid (suspension in water)
9.2. Colour	Off-white/brown
9.3. Odour	Characteristic odour between fish- and glue-like
9.4. Melting point	< 0°C
9.5. Boiling point	> 100°C
9.6. Specific gravity	1.09 g/ml
9.7. Vapour pressure	Flutriafol : 5.3×10^{-11} mm Hg at 20°C Carbendazim : 7×10^{-7} mm Hg at 20°C
9.8. Viscosity	400 - 600 cP
9.9. Surface tension	Not available
9.10. Solubility in water	The product can be dispersed in water. Flutriafol : 130 mg/l at 20°C Carbendazim : 8 mg/l at 25°C and pH 7
9.11. Solubility in organic solvents	Flutriafol : soluble in acetone, methanol, dichloromethane slightly soluble in xylene Carbendazim : slightly soluble in polar organic solvents, not soluble in apolar solvents
9.12. Partition coefficient n-octanol/water	Flutriafol : $\log K_{ow} = 2.29$ Carbendazim : $\log K_{ow} = 1.49$
9.13. pH	7.4 - 7.7
9.14. Flash point	> 95°C
9.15. Autoignition temperature	Not available
9.16. Explosive properties	Not explosive
9.17. Oxidising properties	Not oxidising

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10. STABILITY AND REACTIVITY

- 10.1. Thermal decomposition Stable at ambient temperatures.
- 10.2. Hazardous decomposition products See 5.2.
- 10.3. Materials to avoid -

11. ♣ TOXICOLOGICAL INFORMATION

- 11.1. Toxicokinetics, metabolism and distribution
Flutriafol is rapidly and extensively absorbed and excreted after oral intake. It is widely distributed in the body, but it preferably binds to red blood cells. Metabolism is almost complete. There is no evidence of accumulation.
Carbendazim is rapidly absorbed and excreted as well. It is widely distributed, but it is found primarily in the liver and kidneys. Metabolism is very limited. There is no evidence of accumulation.
- 11.2. Acute toxicity
The product is not considered as harmful by ingestion, inhalation or skin contact. It may have harmful effects at high exposure.

The acute toxicity of the product is measured as:

Route(s) of entry - ingestion LD₅₀, oral, rat (female): 4400 mg/kg
- skin LD₅₀, dermal, rat: > 2200 mg/kg
- inhalation LC₅₀, inhalation, rat: not available
- 11.3. Irritancy Slightly irritating to skin. Moderately irritating to eyes.
- 11.4. Allergic sensitisation
The product is not a skin sensitizer. However, it contains max. 0.006% of 1,2-benzisothiazol-3(2H)-one, which is an allergic sensitizer.
- 11.5. Chronic toxicity
Repeated exposure to **flutriafol** may cause liver damage. The Lowest Observed Effect Level for this effect has been found to be approx. 150 mg flutriafol/kg bw/day in a 90-day feeding study in rats.
- 11.6. Carcinogenicity
Flutriafol is not carcinogenic.
Carbendazim caused liver tumours in certain mouse strains.
- 11.7. Effects on reproduction
No effects on fertility are found for **flutriafol** at maternal non-toxic doses (10 mg flutriafol/kg bw/day).
Carbendazim caused genotoxic effects and reduced fertility in animal tests at dose levels > 50 mg/kg bw/day.
- 11.8. Teratogenicity
No teratogenic (birth defects causing) effects are found for **flutriafol** at maternal non-toxic doses.
Carbendazim caused malformations and anomalies of offspring at dose levels > 10 mg/kg bw/day in animal tests.
- 11.9. Mutagenicity
Flutriafol is not mutagenic.
Carbendazim caused numerous chromosome aberrations, but is not a heritable gene mutagen.

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12. ♣ ECOLOGICAL INFORMATION

- 12.1. Ecotoxicity The product is very toxic to aquatic invertebrates and toxic to fish. It is harmful to algae, bees and earthworms. It is not considered as harmful to birds and soil microorganisms.

The following has been measured on a similar but more concentrated product:

- Fish	Rainbow trout (<i>Salmo gairdneri</i>)	96-h LC ₅₀ : 4.40 mg/l
- Invertebrates	Daphnids (<i>Daphnia magna</i>)	48-h EC ₅₀ : 0.46 mg/l
- Algae	Green algae (<i>Selenastrum capricornutum</i>)	72-h IC ₅₀ : 26.9 mg/l

- 12.2. Mobility **Flutriafol** has moderate mobility in soil. Absorption to soil depends on soil pH and organic matter content.
Carbendazim absorbs strongly to soil particles and is therefore not mobile, but may accumulate if used repeatedly.
- 12.3. Persistence and degradability **Flutriafol** is not readily degradable. Degradation half-lives vary with circumstances, but are usually over 1 year in soil and water.
Carbendazim degrades only very slowly in the environment.
- 12.4. Bioaccumulative potential **Flutriafol** does not bioaccumulate. The bioaccumulation factor of flutriafol is measured to be 7 for whole fish (rainbow trout).
Bioaccumulation of **carbendazim** is not expected.

13. DISPOSAL CONSIDERATIONS

- 13.1. Waste disposal method Material that cannot be reused or chemically reprocessed 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.
- 13.2. Container disposal Triple rinse (or equivalent) and offer for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.
- Disposal of waste and packagings must always be in accordance with all applicable local regulations.

14. ♣ TRANSPORT INFORMATION

ADR/RID classification

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Carbendazim and flutriafol)
Class	9
UN no.	3082
Packaging group	III

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IMDG classification

Proper shipping name Environmentally hazardous substance, liquid, n.o.s. (Carbendazim and flutriafol)
Class 9
UN no. 3082
Packaging group III
Marine pollutant Marine pollutant

IATA/ICAO classification

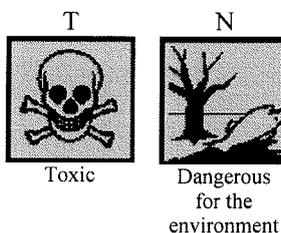
Proper shipping name Environmentally hazardous substance, liquid, n.o.s. (Carbendazim and flutriafol)
Class 9
UN no. 3082
Packaging group III

15. ♣ REGULATORY INFORMATION

15.1. LABELLING IN THE EU

According to Dir. 1999/45/EC as amended

Hazard symbols



Contains Carbendazim and flutriafol

R-phrases R46-60-61-50/53: May cause heritable genetic damage. May impair fertility. May cause harm to the unborn child. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrases S36/37/39-60-61: Wear suitable protective clothing, gloves and eye/face protection. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

Other mentions Contains 1,2-benzisothiazol-3(2H)-one. May produce an allergic reaction.

To avoid risks to man and the environment, comply with the instructions of use.

15.2. GLOBALLY HARMONISED SYSTEM

According to Reg. 1272/2008 as amended

CLP classification Eye irritation: Category 2
Germ cell mutagenicity: Category 1B
Toxic to reproduction: Category 1B
Hazards to the aquatic environment: Category acute 1 and chronic 1

CLP labelling

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Hazard pictograms required on label



Signal word	Danger
Hazard statements	H319: Causes serious eye irritation. H340: May cause genetic defects. H360: May damage fertility and the unborn child. H410: Very 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	
Prevention	P264: Wash hands thoroughly after handling. P280: Wear eye protection. P202: Do not handle until all safety precautions have been read and understood.
Response	P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313: If eye irritation persists: Get medical advice/attention.
Disposal	P501: Dispose of contents/container in accordance with local regulations.
15.3. Regulatory status	All ingredients in the product are covered by EU chemical legislation.

16. OTHER INFORMATION

Used R-phrases	R22	Harmful if swallowed.
	R38	Irritating to skin.
	R41	Risk of serious damage to eyes.
	R43	May cause sensitisation by skin contact.
	R46	May cause heritable genetic damage.
	R50	Very toxic to aquatic organisms.
	R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R60	May impair fertility.
	R61	May cause harm to the unborn child.

This material should only be used by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product vary and situations unforeseen by Cheminova A/S may exist. Regulatory information is subject to changes. It may be necessary for the user to check the validity of the information under local circumstances.