

Product no. 88B/8830  
Product name **TRINEXAPAC-ETHYL 250 g/l EC**

September 2011 - UK  
Supersedes August 2009

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## SAFETY DATA SHEET

# Freeze 250 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** ..... **TRINEXAPAC-ETHYL 250 g/l EC**  
**Contains trinexapac-ethyl**
- 1.2. **Relevant identified uses of the substance or mixture and uses advised against** ..... Can be used as plant growth regulator only. The product is shipped ready for the end-user or may need to be filled into its final containers.
- 1.3. **Details of the supplier of the safety data sheet** ..... **CHEMINOVA A/S**  
P.O. Box 9  
DK-7620 Lemvig  
Denmark  
[sds@cheminova.dk](mailto:sds@cheminova.dk)
- 1.4. **Emergency telephone number** .... (+45) 97 83 53 53 (24 h; for emergencies only)

### ♣ SECTION 2: HAZARDS IDENTIFICATION

- 2.1. **Classification of the substance or mixture** ..... See section 16 for full text of R-phrases and hazard statements.
- DPD classification of the product according to Dir. 1999/45/EC as amended ..... Xi;R36 R52/53
- CLP classification of the product according to Reg. 1272/2008 as amended ..... Hazards to the aquatic environment: Chronic Category 3 (H412)
- WHO classification ..... Class U (unlikely to present acute hazard in normal use)  
Guidelines to Classification 2009
- Health hazards ..... The product may cause mild eye irritation.
- Environmental hazards ..... The product is harmful to aquatic organisms.
- 2.2. **Label elements**  
*According to Dir. 1999/45/EC as amended*  
Hazard symbol ..... Xi



Irritant

Contains trinexapac-ethyl

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R-phrases	
R36 .....	Irritating to eyes.
R52/53 .....	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrases	
S25 .....	Avoid contact with eyes.
S57 .....	Use appropriate containment to avoid environmental contamination.
Other mention .....	To avoid risks to man and the environment, comply with the instructions of use.

Additional phrases for final use of the product for plant protection

S2 .....	Keep out of the reach of children.
S23 .....	Do not breathe spray.
S29 .....	Do not empty into drains.
SP1 .....	Do not contaminate water with the product or its container (Do not clean application equipment near surface water/Avoid contamination via drains from farmyards and roads).

According to EU Reg. 1272/2008 as amended

Product identifier .....	Trinexapac-ethyl 250 g/l EC Contains trinexapac-ethyl
Hazard pictograms .....	None
Signal word .....	None
Hazard statement	
P412 .....	Harmful to aquatic life with long lasting effects.
Supplementary hazard statements	
EUH401 .....	To avoid risks to human health and the environment, comply with the instructions of use.
Supplementary phrase for final use of the product for plant protection: SP1	Do not contaminate water with the product or its container (Do not clean application equipment near surface water/Avoid contamination via drains from farmyards and roads).
Precautionary statements	
P273 .....	Avoid release to the environment.
P501 .....	Dispose of contents/container in accordance with local regulation.
2.3. <b>Other hazards</b> .....	None of the ingredients meets the criteria for being PBT or vPvB.

**♣ SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

- 3.1. **Substances** ..... The product is a mixture, not a substance
- 3.2. **Mixtures** ..... See section 16 for full text of R-phrases and hazard statements.

Active ingredient

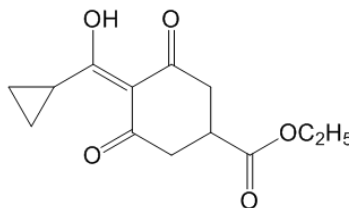
<b>Trinexapac-ethyl</b> .....	Content: 23% by weight
CAS name .....	Cyclohexanecarboxylic acid, 4-(cyclopropylhydroxymethylene)-3,5-dioxo-, ethyl ester
CAS no. ....	95266-40-3

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IUPAC name(s) ..... 4-(Cyclopropylhydroxymethylene)-3,5-dioxocyclohexane-carboxylic acid ethyl ester  
Ethyl 4-cyclopropyl(hydroxy)methylene-3,5-dioxocyclohexane-carboxylate  
ISO name/EU name ..... Trinexapac-ethyl  
EC no. (EINECS no.) ..... None  
EU index no. .... None  
DSD classification of the ingredient R52/53  
CLP classification of the ingredient Hazards to the aquatic environment: Chronic Category 2 (H412)  
Structural formula .....



Reportable ingredients

	Content (% w/w)	CAS no.	EC no.	DSD classification	CLP classification
Tetrahydrofurfuryl alcohol	40 - 70	97-99-4	EINECS no. 202-625-6	Xi;R36 Irritant	Not yet available
Poly(oxy-1,2-ethane-diyl), $\alpha$ -[2,4,6-tris-(1-phenylethyl)-phenyl]- $\omega$ -hydroxy-	10 - 30	99734-09-5	List no. 619-457-8	Xi;R36 N;R51/53 Irritant, dangerous for the environment	Eye Irrit. 2 (H319) Aquatic Chronic 2 (H411)
Docosate sodium	1 - 5	577-11-7	EINECS no. 209-406-4	Xi;R38-41 Irritant	Skin Irrit. 2 (H315) Eye Dam. 1 (H318)

**SECTION 4: FIRST AID MEASURES**

4.1. **Description of first aid measures**

Inhalation ..... If experiencing any discomfort, immediately remove from exposure. Get medical attention if discomfort does not disappear.

Skin contact ..... Immediately remove contaminated clothing and footwear. Flush skin with much 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. Get medical attention immediately.

Ingestion ..... Inducing vomiting is not recommended. Rinse mouth and drink several glasses of water or milk. If vomiting does occur, rinse mouth and drink fluids again. Consult a physician.

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

To our knowledge, adverse effects in humans have not been reported.

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

**SECTION 5: FIREFIGHTING MEASURES**

- 5.1. **Extinguishing media** ..... Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.
- 5.2. **Special hazards arising from the substance or mixture** The essential breakdown products are carbon monoxide and carbon 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, closable vessels for the collection of spills should be available.  
  
In case of large spill (involving 10 tons of the product or more):  
1. Use personal protection equipment; see section 8  
2. Call emergency telephone no.; see section 1  
3. Alert authorities.  
  
Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and boots.  
  
Stop the source of the spill immediately if safe to do so. 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.
- 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

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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.

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** ..... Keep away from sources of ignition and protect from exposure to fire and heat.
- In an industrial environment it is recommended to avoid all personal contact with the product, if possible by using closed systems with remote system control. Otherwise, the material should be handled by mechanical means as much as possible. Adequate ventilation or local exhaust ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.
- For its use as a plant growth regulator, 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. Wash protective clothing and protective equipment with water and soap after each use.
- 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. 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.
- Keep in 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. 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.

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7.3. **Specific end use(s)** ..... The product is a registered plant growth regulator 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 trinexapac-ethyl. For tetrahydrofurfuryl alcohol, the AIHA has established a Workplace Environmental Exposure Level (WEEL, TWA) of 2 ppm.  
  
However, other personal exposure limits defined by local regulations may exist and must be observed.

Monitoring methods ..... The supplier of the safety data sheet can be contacted for monitoring methods.

**Trinexapac-ethyl**  
DNEL, oral ..... 0.34 mg/kg bw/day  
PNEC, aquatic environment ..... 0.0034 mg/l

8.2. **Exposure controls** ..... When used in a closed system, personal protection equipment will not be required. Consider the need to render equipment or piping systems non-hazardous when it is necessary to open the system.  
  
When the use of a closed system is not possible, it is recommended to avoid personal exposure as much as possible by mechanical means, e.g. shielding, ventilation.  
  
For filling of the product into final containers at a dedicated facility, use of protective gloves and chemical resistant coverall or apron will be required when no other protective means are available.  
  
For use as plant growth regulator use of gloves is required.  
  
In cases of incidental high exposure, more personal protection equipment may be necessary, such as face mask and chemical resistant coveralls.



Respiratory protection The product is not likely to present an airborne exposure concern during normal handling, but in the event of a discharge of the material which produces a heavy vapour or mist, workers should put on officially approved respiratory protection equipment with a universal filter type including particle filter.



Protective gloves ..... Wear natural rubber gloves if much manual labour with the substance is required. The breakthrough time of this material for the product is unknown, but it is expected that it will give adequate protection.



Eye protection ..... Wear goggles or safety glasses. It is recommended to have an eye wash fountain immediately available in the work area when there is a potential for eye contact.

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Other skin protection

Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls of PE will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of appreciable or prolonged exposure, coveralls of barrier laminate may be required.

## ♣ SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on physical and chemical properties

Appearance .....	Red-brown liquid
Odour .....	Glue-like smell
Odour threshold .....	Not determined
pH .....	1% dilution in water: 3.5 at 20°C
Melting point/freezing point .....	Not determined
Initial boiling point and boiling range	Not determined
	<b>Tetrahydrofurfuryl alcohol</b> : 178°C
	<b>Trinexapac-ethyl</b> : Decomposes, starting at 310°C
Flash point .....	78°C
Evaporation rate .....	Not determined
Flammability (solid/gas) .....	Not applicable (the product is a liquid)
Upper/lower flammability or explosive limits .....	<b>Tetrahydrofurfuryl alcohol</b> : 1.5 - 9.7 vol%
Vapour pressure .....	<b>Tetrahydrofurfuryl alcohol</b> : 30 Pa at 20°C
	<b>Trinexapac-ethyl</b> : 2.16 x 10 <sup>-3</sup> Pa at 25°C
Vapour density .....	(Air = 1)
	<b>Tetrahydrofurfuryl alcohol</b> : 3.5
Relative density .....	Not determined
	Density: 1.10 g/ml
Solubility(ies) .....	Solubility of <b>trinexapac-ethyl</b> at 25°C in:
	methanol > 500 g/l
	acetone > 500 g/l
	n-octanol 420 g/l
	toluene > 500 g/l
	dichloromethane > 500 g/l
	ethyl acetate > 500 g/l
	hexane 45 g/l
	water 1.1 g/l at pH 3.5
	2.8 g/l at pH 4.9
	10.2 g/l at pH 5.5
	21.1 g/l at pH 8.2
Partition coefficient n-octanol/water	<b>Trinexapac-ethyl</b> : log K <sub>ow</sub> = 1.5 at pH 5 and 25°C
	log K <sub>ow</sub> = -0.29 at pH 6.9 and 25°C
	log K <sub>ow</sub> = -2.1 at pH 8.9 and 25°C
Autoignition temperature .....	268°C
Decomposition temperature .....	Not determined
Viscosity .....	23 mPa.s at 20°C, 10 mPa.s at 40°C
Explosive properties.....	Not explosive
Oxidising properties .....	Not oxidising

### 9.2. Other information

Miscibility ..... The product is dispersible in water.

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#### ♣ SECTION 10: STABILITY AND REACTIVITY

- 10.1. **Reactivity** ..... To our knowledge, the product has no special reactivities.
- 10.2. **Chemical stability** ..... Stable at ambient temperatures.
- 10.3. **Possibility of hazardous reactions** None known.
- 10.4. **Conditions to avoid** ..... Heating of the product will produce 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

###### Product

Acute toxicity ..... The product is not expected to be harmful by inhalation, in contact with skin or if swallowed. However, it should always be treated with the usual care of handling chemicals. The acute toxicity of the product is measured as:

Route(s) of entry - ingestion LD<sub>50</sub>, oral, rat: > 2000 mg/kg (method OECD 420)  
- skin LD<sub>50</sub>, dermal, rat: > 2000 mg/kg (method OECD 402)  
- inhalation LC<sub>50</sub>, inhalation, rat: > 5.16 mg/l/4 h (method OECD 403)

Based on available data, the classification criteria are not met.  
(B.o.a.d.t.c.c.a.n.m.)

Skin corrosion/irritation ..... Slightly irritating to skin (method OECD 404). B.o.a.d.t.c.c.a.n.m.

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

Respiratory or skin sensitisation ... Not a skin sensitizer (method OECD 429). B.o.a.d.t.c.c.a.n.m.

Aspiration hazard ..... The product does not present an aspiration hazard.  
B.o.a.d.t.c.c.a.n.m.

Symptoms and effects, acute and delayed To our knowledge, adverse effects in humans have not been reported. In animal tests, reduced activity and shortness of breath were seen at high dosage.

###### Trinexapac-ethyl

Acute toxicity ..... Trinexapac-ethyl is not harmful by single exposure.  
B.o.a.d.t.c.c.a.n.m. The acute toxicity is measured as:

Route(s) of entry - ingestion LD<sub>50</sub>, oral, rat (female): 4210 mg/kg (method OECD 401)  
LD<sub>50</sub>, oral, rat (male): 4610 mg/kg  
- skin LD<sub>50</sub>, dermal, rat: > 4000 mg/kg (method OECD 402)  
- inhalation LC<sub>50</sub>, inhalation, rat: > 5.3 mg/l/4 h (method OECD 403)



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Skin corrosion/irritation .....	Not irritating to skin (method OECD 404). B.o.a.d.t.c.c.a.n.m.
Serious eye damage/irritation .....	Slightly irritating to eyes (method OECD 405). B.o.a.d.t.c.c.a.n.m.
Respiratory or skin sensitisation ...	Not sensitizing (method OECD 406). B.o.a.d.t.c.c.a.n.m.
Germ cell mutagenicity .....	Trinexapac-ethyl did not induce chromosome aberrations in Chinese hamster ovary cells (method OECD 473). Trinexapac-ethyl was negative in a range of other tests. B.o.a.d.t.c.c.a.n.m.
Carcinogenicity .....	No carcinogenic effects were observed in mice (method OECD 453). In rats, neoplasms occurred at very high dosage only. These observations were deemed not to be evaluable. B.o.a.d.t.c.c.a.n.m.
Reproductive toxicity .....	No effects on fertility are found for trinexapac-ethyl at maternal non-toxic doses (method OECD 416). Trinexapac-ethyl was not teratogenic (not causing birth defects) (method OECD 414). B.o.a.d.t.c.c.a.n.m.
STOT – single exposure .....	To our knowledge, no specific effects have been observed. B.o.a.d.t.c.c.a.n.m.
STOT – repeated exposure .....	Target organ: kidneys, liver NOAEL: 500 ppm (34 mg/kg bw/day) in a 90 day rat study (method OECD 408) based on histological effects on kidneys and increase in liver weight. B.o.a.d.t.c.c.a.n.m.
<u><i>Tetrahydrofurfuryl alcohol</i></u>	
Acute toxicity .....	Tetrahydrofurfuryl alcohol is not harmful by single exposure. B.o.a.d.t.c.c.a.n.m. The acute toxicity is measured as:
Route(s) of entry	
- ingestion	LD <sub>50</sub> , oral, rat: > 2000 mg/kg (method OECD 423)
- skin	LD <sub>50</sub> , dermal, rat: not available
- inhalation	LC <sub>50</sub> , inhalation, rat: not available
Skin corrosion/irritation .....	Not irritating to skin. B.o.a.d.t.c.c.a.n.m.
Serious eye damage/irritation .....	Moderately irritating to eyes. B.o.a.d.t.c.c.a.n.m.
Respiratory or skin sensitisation ...	No information is available.
Germ cell mutagenicity .....	Results from mutagenicity tests on germ cells are not available. Tetrahydrofurfuryl alcohol was negative in a number of other tests. B.o.a.d.t.c.c.a.n.m.
Carcinogenicity .....	Not available.
Reproductive toxicity .....	Decreased weight of testes, necrosis of seminiferous tubular epithelium, early resorption and decreased fetal weight were seen at dosage levels which also caused other adverse effects. B.o.a.d.t.c.c.a.n.m.
STOT – single exposure .....	The substance may have narcotic effects at high doses. B.o.a.d.t.c.c.a.n.m.

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STOT – repeated exposure .....	Organic solvents generally are suspected to cause irreversible damage to the nervous system on repeated exposure.
	Target organs: liver, testes NOAEL: 500 ppm (approx. 40 mg/kg bw/day) in a 90 day rat study based on increase in liver weight and decreased weight of testes. B.o.a.d.t.c.c.a.n.m.
Aspiration hazard .....	Tetrahydrofurfuryl alcohol is not of a type usually considered to present an aspiration pneumonia hazard, but it may cause aspiration pneumonia under special circumstances. B.o.a.d.t.c.c.a.n.m.
<u><i>Poly(oxy-1,2-ethanediyl), <math>\alpha</math>-[2,4,6-tris(1-phenylethyl)phenyl]-<math>\omega</math>-hydroxy-</i></u>	
Skin corrosion/irritation .....	May cause skin irritation. B.o.a.d.t.c.c.a.n.m.
Serious eye damage/irritation .....	Irritating to eyes.
STOT – single exposure .....	May cause irritation of the mucous membranes.
Other endpoints .....	No more information is available.
<u><i>Docusate sodium</i></u>	
Acute toxicity .....	The substance is not considered as harmful by ingestion, skin contact and inhalation. B.o.a.d.t.c.c.a.n.m. The acute toxicity is measured as:
Route(s) of entry	
- ingestion	LD <sub>50</sub> , oral, rat: > 2100 mg/kg (method OECD 401)
- skin	LD <sub>50</sub> , dermal, rat: > 10000 mg/kg (method OECD 402)
- inhalation	LC <sub>50</sub> , inhalation, rat: approx. 20 mg/l/4 h
Skin corrosion/irritation .....	Irritating to skin (method OECD 404).
Serious eye damage/irritation .....	Severely irritating to eyes with the possibility to cause permanent eye damage (method OECD 405).
Respiratory or skin sensitisation ...	To our knowledge, no indications of allergenic properties have been recorded. B.o.a.d.t.c.c.a.n.m.
Germ cell mutagenicity .....	Indications of possible effects were seen in three tests (method OECD 473) The effect was, however, seen in the presence of S-9 only and at doses very close to the threshold of toxicity only. B.o.a.d.t.c.c.a.n.m.
Carcinogenicity .....	No carcinogenic effects observed in two tests (method OECD 451). B.o.a.d.t.c.c.a.n.m.
Reproductive toxicity .....	No effects on fertility and no teratogenic (birth defects causing) effects were observed (method OECD 416). B.o.a.d.t.c.c.a.n.m.
STOT – single exposure .....	To our knowledge, no specific effects after single exposure other than already mentioned have been observed. B.o.a.d.t.c.c.a.n.m.
STOT – repeated exposure .....	NOEL 750 mg/kg bw/day in a 90-day study on rats (method OECD 408). B.o.a.d.t.c.c.a.n.m.

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Aspiration hazard ..... The substance is not of a type known to present an aspiration pneumonia hazard. B.o.a.d.t.c.c.a.n.m.

**♣ SECTION 12: ECOLOGICAL INFORMATION**

12.1. **Toxicity** ..... Trinexapac-ethyl has growth inhibiting effects on many plants. It is considered as non-toxic to fish, aquatic invertebrates, birds, mammals, insects and soil micro- and macro-organisms.

The toxicity of the product is measured as:

- Fish	Rainbow trout ( <i>Oncorhynchus mykiss</i> ) .....	96-h LC <sub>50</sub> : 54 mg/l
- Invertebrates	Daphnids ( <i>Daphnia magna</i> ) .....	48-h EC <sub>50</sub> : > 100 mg/l
- Algae	Green algae ( <i>Pseudokirchneriella subcapitata</i> ) ..	72-h IC <sub>50</sub> : 25.4 mg/l
- Aquatic plants	Duckweed ( <i>Lemna gibba</i> ) .....	7-day EC <sub>50</sub> : 11.0 mg/l
- Earthworms	<i>Eisenia fetida</i> .....	14-day LC <sub>50</sub> : > 1000 mg/kg dry soil
- Insects	Honey bees ( <i>Apis mellifera</i> L.) .....	48-h LD <sub>50</sub> , contact: > 439 µg/bee 48-h LD <sub>50</sub> , oral: > 398 µg/bee

12.2. **Persistence and degradability** .... **Trinexapac-ethyl** does not fulfil the criteria for being readily biodegradable, but it is degraded in the environment. Half-life times are usually less than 1 day in soil. Degradation products are further degraded, but slower. Degradation occurs mainly microbiologically.

The product contains minor amounts of not readily biodegradable ingredients, which may not be degradable in waste water treatment plants.

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

Due to its relatively high solubility in water and degradability, **trinexapac-ethyl** does not bioaccumulate.

12.4. **Mobility in soil** ..... Under normal conditions trinexapac-ethyl is moderately 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 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.

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

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

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

**♣ SECTION 14: TRANSPORT INFORMATION**

ADR/RID/IMDG/IATA/ICAO classification

- 14.1. **UN number** ..... Not classified as hazardous material for transport
- 14.2. **UN proper shipping name** ..... Not applicable
- 14.3. **Transport hazard class(es)** ..... Not applicable
- 14.4. **Packing group** ..... Not applicable
- 14.5. **Environmental hazards** ..... The substance is harmful to aquatic organisms
- 14.6. **Special precautions for user** ..... Do not discharge to the environment.
- 14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code** ..... The product is not transported in bulk tankers.

**♣ SECTION 15: REGULATORY INFORMATION**

- 15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture** ..... To our knowledge, no specific regulations apply.  
All ingredients are covered by EU chemical legislation.
- 15.2. **Chemical safety assessment** ..... A chemical safety assessment has not been performed.

**♣ SECTION 16: OTHER INFORMATION**

- Relevant changes in the SDS ..... Numerous changes have been made to bring the SDS in line with Reg. 453/2010, but these do not involve new information concerning hazardous properties
- List of abbreviations .....  
AIHA American Industrial Hygiene Association  
B.o.a.d.t.c.c.a.n.m.: Based on available data, the classification criteria are not met.  
CAS Chemical Abstracts Service  
CLP Classification, Labelling and Packaging; refers to EU regulation 1272/2008 as amended  
Dir. Directive  
DNEL Derived No Effect Level

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DPD	Dangerous Preparation Directive; refers to Dir. 1999/45/EC as amended
DSD	Dangerous Substance Directive; refers to Dir. 67/548/EEC as amended
EC	Emulsifiable Concentrate or European Community
EC <sub>50</sub>	50% Effect Concentration
EINECS	European Inventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized classification and labelling System of chemicals, Fourth revised edition 2011
IBC	International Bulk Chemical code
IC <sub>50</sub>	50% Inhibition Concentration
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC <sub>50</sub>	50% Lethal Concentration
LD <sub>50</sub>	50% Lethal Dose
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOEL	No Observed Effect Level
N.o.s.	Not otherwise specified
OECD	Organisation for Economic Cooperation and Development
PBT	Persistent, Bioaccumulative, Toxic
PE	Polyethylene
PNEC	Predicted No Effect Concentration
Reg.	Regulation
R-phrased	Risk phrase
S-9	Post-mitochondrial fraction prepared from the livers of rodents used for metabolic activation
SDS	Safety Data Sheet
SP	Safety Precaution
S-phrase	Safety phrase
STOT	Specific Target Organ Toxicity
TWA	Time Weighted Average
UDS	Unscheduled DNA Synthesis
vPvB	very Persistent, very Bioaccumulative
WHO	World Health Organisation

References ..... Toxicity and ecotoxicity 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 method

Used R-phrases .....  
R36 Irritating to eyes.  
R38 Irritating to skin.  
R41 Risk of serious damage to eyes.  
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Used CLP hazard statements .....  
H315 Causes skin irritation.  
H318 Causes serious eye damage.  
H319 Causes serious eye irritation.  
H411 Toxic to aquatic life with long lasting effects.  
H412 Harmful to aquatic life with long lasting effects.

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

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

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

Prepared by: Cheminova A/S  
Safety, Health, Environment & Quality Department / GHB

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**Annex I: Estimation of operator exposure during filling of the formulation into final containers at a dedicated facility**

Process Category: PROC8

The product is a formulation which is filled into jars ranging in size of 1 to 10 litres. The operator exposure is estimated with a model similar to the German model and the UK Pesticide Operator Exposure Model (POEM) which are developed for use of plant protection products. As a worst case assumption, a value of 70% dermal absorption is used. The estimates of total exposure predicted by these models were calculated and summarised as a proportion of the DNEL for the active ingredient of 0.34 mg/kg bw/day.

Using the German model without personal protection equipment (PPE) and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 142 mg/person/day or 2.03 mg/kg bw/day. This is above the DNEL of 0.34 mg/kg bw/day, and therefore PPE has to be used.

Use of suitable gloves is assumed to reduce dermal absorption via the hands and use of apron or coveralls is assumed to reduce dermal absorption via the body and head by 99%.

Using the German model with use of gloves and apron/coverall and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 3.88 mg/person/day or 0.055 mg/kg bw/day. This is below the DNEL of 0.34 mg/kg bw/day and can be considered acceptable.

Using the UK POEM without PPE and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 1077 mg/person/day or 17.95 mg/kg bw/day. This is above the DNEL of 0.34 mg/kg bw/day, and therefore PPE has to be used.

In the UK POEM as well, use of suitable gloves and coveralls/apron is assumed to reduce dermal absorption by 99%.

Using the UK POEM when gloves and coveralls/apron are used and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 10.80 mg/person/day or 0.18 mg/kg bw/day. This is below the DNEL of 0.34 mg/kg bw/day.

According to the UK POEM exposure is acceptable when gloves and coveralls/apron are used during filling and otherwise worst case situations are assumed.

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## Annex II: Estimation of operator exposure for use as plant protection product

Process Categories: PROC9, PROC 11

The product is a water-dispersible formulation which is packaged in jars ranging in size of 1 to 10 litres. The product (plant growth regulator) is diluted with water and applied primarily using tractor mounted field crop sprayers with hydraulic boom and nozzles once or twice during a growing season, typically during spring. Only application to field crops is intended.

The operator exposure is estimated with the German model and the UK Pesticide Operator Exposure Model (POEM). As a worst case assumption, a value of 70% dermal absorption is used. The estimates of total exposure predicted by the German model and the UK POEM were calculated and summarised as a proportion of the DNEL for the active ingredient of 0.34 mg/kg bw/day.

The assumptions/data utilised in the models are given in Table 1:

Table 1: Assumptions/data utilised in the models		
	German model	UK POEM
Area treated in one day	20 ha	50 ha
Max. application rate	1 kg of product/ha	1 kg of product/ha
Max. use concentration (application volume 150 l/ha)	not relevant	1.67 mg as/ml
Packaging	not relevant	5 l jar
Dermal absorption rate	70%	70%
Glove penetration	1%	1%
Body weight of operator	70 kg	60 kg

Estimations of exposure using the German model are given in Table 2 (tractor mounted sprayer, no PPE):

Table 2: Estimated operator exposure using the German model	
Exposure during mixing/loading	
$I_{m/l} = 0.008 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 0.040 mg/person/day
$D_{m/l} = 2.0 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 10 mg/person/day
Exposure during application	
$I_a = 0.001 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 0.005 mg/person/day
$D_{a/c} = 0.06 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 0.30 mg/person/day
$D_{a/h} = 0.38 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 1.90 mg/person/day
$D_{a/b} = 1.6 \text{ mg/kg} \times 0.25 \text{ kg/ha} \times 20 \text{ ha/d}$	= 8.0 mg/person/day
Total exposure	20.245 mg/person/day
Total systemic exposure (dermal absorption rate 70%, inhalation absorption rate 100%)	14.185 mg/person/day
	0.203 mg/kg bw/day

Abbreviations: I = estimated inhalation exposure  
D = estimated dermal exposure  
m/l = during mixing/loading  
a = during application  
(c) = head  
(h) = hands  
(b) = body



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Using the German model without PPE and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 14.185 mg/person/day or 0.203 mg/kg bw/day. This is below the DNEL of 0.34 mg/kg bw/day and must be considered acceptable.

Using the UK POEM without PPE and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 398.6 mg/person/day or 6.64 mg/kg bw/day. This is above the DNEL of 0.34 mg/kg bw/day, and therefore PPE has to be used.

In the UK POEM, use of suitable gloves is assumed to reduce dermal absorption via the hands by 99%.

Using the UK POEM when gloves are used and taking a 70% dermal absorption value into account, the estimated exposure is calculated to be 6.64 mg/person/day or 0.11 mg/kg bw/day. This is below the DNEL of 0.34 mg/kg bw/day.

According to the UK POEM exposure is acceptable when gloves are used during mixing/loading and during spraying and otherwise worst case situations are assumed.