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CVR No. DK 12 76 00 43

SAFETY DATA SHEET

FREEZE NT
8830-02, TRINEXAPAC-ETHYL 250 g/l EC

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

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

1.1. **Product identifier** .....

FREEZE NT
8830-02, TRINEXAPAC-ETHYL 250 g/l EC

1.2. **Relevant identified uses of the substance or mixture and uses advised against** .....

Can be used as a plant growth regulator only.

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

CHEMINOVA A/S, a subsidiary of FMC Corporation
Thyborønvej 78
DK-7673 Harboøre
Denmark
SDS.Ronland@fmc.com

1.4. **Emergency telephone number**
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): +353 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
South Africa: +27 83 123 3911 (Bateleur Emergency Response Co.)
Spain: +34 91 562 04 20
Sweden: +46 08-331231
112
Switzerland: 145
Turkey: 114
United Kingdom: 111
U.S.A. & Canada: +1 800 / 331-3148 (ProPharma)
All other countries: +1 651 / 632-6793 (ProPharma - Collect)

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SECTION 2: HAZARDS IDENTIFICATION

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

Eye irritation: Category 2 (H319)
Sensitisation – skin: Category 1B (H317)
Hazards to the aquatic environment, chronic: Category 3 (H412)

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

Health hazards ..... The product has irritating properties. It may be allergenic to certain individuals.

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

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... 8830-02, Trinexapac-ethyl 250 g/l EC

Hazard pictogram (GHS07) .....

Signal word ..... Warning

Hazard statements
H317 ..... May cause an allergic skin reaction.
H319 ..... Causes serious eye irritation.
H412 ..... Harmful to aquatic life with long lasting effects.

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

Precautionary statements
P264 ..... Wash hands thoroughly after handling.
P273..... Avoid release to the environment.
P280 ..... Wear protective gloves / protective clothing / eye protection
P302+P352 IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338 ..... IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313 If skin irritation occurs: Get medical advice/attention
P337+P313 ..... If eye irritation persists: Get medical advice/attention.
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.

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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 statement.

Active ingredient

Trinexapac-ethyl..... Content: 25% by weight

CAS name ..... Cyclohexanecarboxylic acid, 4-(cyclopropylhydroxymethylene)-3,5-dioxo-, ethyl ester

CAS no. 95266-40-3

IUPAC name ..... 4-(Cyclopropylhydroxymethylene)-3,5-dioxocyclohexane-carboxylic acid ethyl ester
Ethyl 4-cyclopropyl(hydroxy)methylene-3,5-dioxocyclohexane-carboxylate

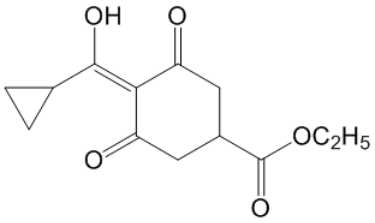
ISO name/EU name ..... Trinexapac-ethyl

EC no. (EINECS no.) ..... None

EU index no. ..... None

Classification of the ingredient ..... Hazards to the aquatic environment, chronic: Category 2 (H411)

Structural formula .....



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 ..... 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 ..... 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. Eye contact can result in irritation. In animal tests, reduced activity and shortness of breath were seen at high exposure.

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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 of a large quantity of the product.

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.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. **Extinguishing media** .....

Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.

5.2. **Special hazards arising from the substance or mixture**

The essential breakdown products are carbon monoxide 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 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 vapour and 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.

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

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

Surface water drains should be covered if appropriate. Minor spills on the floor or other impervious surface should be absorbed onto an absorptive material such as universal binder, hydrated lime, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Clean area with much water and industrial detergent. Absorb wash liquid onto absorbent and transfer to suitable containers. The used containers should be properly closed and labelled.

Large spills which soak into the ground should be dug up and transferred to suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal.

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

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

SECTION 7: HANDLING AND STORAGE

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

In an industrial environment, it is 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 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. 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.

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.

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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.

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 any of the ingredients in the product. However, personal exposure limits defined by local regulations may exist and must be observed.

Trinexapac-ethyl

DNEL, systemic ..... 0.34 mg/kg bw/day

PNEC, aquatic environment ..... 41 µg/l

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

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

The precautions mentioned below are primarily meant for handling of the undiluted product and for preparing the 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 natural rubber gloves if much manual labour with the product is required. The breakthrough time of this material for the product is unknown, but it is expected that it will give adequate protection.

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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	Yellow or brown transparent liquid
Odour	Soap-like
Odour threshold	Not determined
pH	1% aqueous dilution: 3.72
Melting point/freezing point	Not determined
Initial boiling point and boiling range	Not determined **Trinexapac-ethyl** : decomposes
Flash point	76°C
Evaporation rate	Not determined
Flammability (solid/gas)	Not applicable (liquid)
Upper/lower flammability or explosive limits	Not determined
Vapour pressure	**Trinexapac-ethyl** : 2.16 x 10^{-3} Pa at 25°C
Vapour density	Not determined
Relative density	1.011 at 20°C
Solubility(ies)	Solubility of **trinexapac-ethyl** at 25°C in: acetone > 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	**Trinexapac-ethyl** : log K_{ow} = 1.5 at pH 5 and 25°C log K_{ow} = -0.29 at pH 6.9 and 25°C log K_{ow} = -2.1 at pH 8.9 and 25°C
Autoignition temperature	269°C
Decomposition temperature	310°C
Viscosity	16.4 mPa.s at 20°C and 417 s^{-1} 14.1 mPa.s at 40°C and 417 s^{-1}
Explosive properties	Not explosive
Oxidising properties	Not oxidising

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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.

Product

Acute toxicity ..... The substance is not expected to be harmful by inhalation, in contact with skin or if swallowed. * The acute toxicity of the product is measured as:

Route(s) of entry	- ingestion	LD_{50}, oral, rat: > 2000 mg/kg (method OECD 423)
	- skin	LD_{50}, dermal, rat: > 2000 mg/kg (method OECD 402)
	- inhalation	LC_{50}, inhalation, rat: > 5.08 mg/l/4 h (method OECD 403)

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

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

Respiratory or skin sensitisation ... Sensitising to skin (method OECD 429).

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

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

Reproductive toxicity ..... The product contains no ingredients found to have adverse effects on reproduction. *

STOT – single exposure ..... To our knowledge, no specific effects have been observed after single exposure. *

STOT – repeated exposure ..... The following was measured on the active ingredient trinexapac-ethyl:

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The major effects seen after repeated dosing were decreased body and organ weights. A LOAEL of 346 mg/kg bw/day was seen in a 13-week oral rat study (method: OECD 408), based on reduced food consumption, reduced body weight gain and kidney effects. *

Aspiration hazard ..... The product does not present an aspiration hazard. *

Symptoms and effects, acute and delayed: To our knowledge, adverse effects in humans have not been reported. Eye contact can result in irritation. In animal tests, reduced activity and shortness of breath were seen at high exposure.

Trinexapac-ethyl

Toxicokinetics, metabolism and distribution: After oral administration, trinexapac-ethyl is rapidly absorbed in the body and mostly distributed to kidneys, liver and plasma. It is only partially metabolised and rapidly excreted. There is no evidence of accumulation.

Acute toxicity ..... The substance is not harmful by inhalation, in contact with skin or if swallowed. *

Route(s) of entry	- ingestion	LD_{50}, oral, rat: 4210 mg/kg (method OECD 401)
	- skin	LD_{50}, dermal, rat: > 4000 mg/kg (method OECD 402)
	- inhalation	LC_{50}, inhalation, rat: > 5.3 mg/l/4 h (method OECD 403)

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

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

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

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 macroorganisms.

The ecotoxicity of the product is measured as:

- Fish	Rainbow trout (*Oncorhynchus mykiss*)	96-h LC_{50}: 13.7 mg/l
- Invertebrates	Daphnids (*Daphnia magna*)	48-h EC_{50}:21.5 mg/l
- Algae	Green algae *(Pseudokirchinella subcapitata)*	72-h IC_{50}: 16.6 mg/l
- Plants	Duckweed (*Lemna gibba*)	7-day EC_{50}: > 100 mg/l 7-day NOEC: 3.2 mg/l

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

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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.

The potential for bioaccumulation is low, as the bioaccumulation factor of **trinexapac-ethyl** is 6 for whole fish.

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 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.

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SECTION 14: TRANSPORT INFORMATION

ADR/RID/IMDG/IATA/ICAO classification

14.1. **UN number** ..... Not classified for 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** ..... Harmful to aquatic organisms

14.6. **Special precautions for user** ..... Avoid any unnecessary contact with the product. 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**

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 .....

CAS	Chemical Abstracts Service
Dir.	Directive
DNEL	Derived No Effect Level
EC	Emulsifiable Concentrate, or European Community
EC_{50}	50% Effect Concentration
EINECS	European INventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
IBC	International Bulk Chemical code
IC_{50}	50% Inhibition Concentration

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ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose
LOAEL	Lowest Observed Adverse Effect Level
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOEC	No Observed Effect Concentration
OECD	Organisation for Economic Cooperation and Development
PBT	Persistent, Bioaccumulative, Toxic
PNEC	Predicted No Effect Concentration
Reg.	Regulation
STOT	Specific Target Organ Toxicity
vPvB	very Persistent, very Bioaccumulative
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 ..... Eye irritation: test data
Sensitisation – skin: test data
Hazards to the aquatic environment: calculation rules

Used hazard statements .....

H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
EUH401	To avoid risks to human health and the environment, comply with the instructions of use.

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

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

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