

# SAFETY DATA SHEET

according to the Globally Harmonized System



## Multivitamin (with Starch) Formulation

Version 1.0 Revision Date: 11.09.2025 SDS Number: 11574835-00001 Date of last issue: - Date of first issue: 11.09.2025

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### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Multivitamin (with Starch) Formulation

Product code : ANTISTRESS FISH

#### Manufacturer or supplier's details

Company : MSD

Address : Briahnager - Off Pune Nagar Road  
Wagholi - Pune - India 412 207

Telephone : +1-908-740-4000

Emergency telephone number : +1-908-423-6000

E-mail address : EHSDATASTEWARD@msd.com

#### Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

Restrictions on use : Not applicable

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### 2. HAZARDS IDENTIFICATION

#### Manufacture, Storage and Import of Hazardous Chemicals Rules 1989

##### Classification

Not classified as hazardous according to criteria laid down in Part I of Schedule-1.

##### GHS Classification

Serious eye damage/eye irritation : Category 2A

Specific target organ toxicity - single exposure : Category 3

##### GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.

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### Precautionary statements

: **Prevention:**

P261 Avoid breathing dust.  
P264+P265 Wash hands thoroughly after handling. Do not touch eyes.  
P271 Use only outdoors or with adequate ventilation.  
P280 Wear eye protection/ face protection.

**Response:**

P304 + P340 + P319 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical help if you feel unwell.  
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 + P317 If eye irritation persists: Get medical help.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

### Additional Labelling

The following percentage of the mixture consists of ingredient(s) with unknown acute oral toxicity: 2.5 %

The following percentage of the mixture consists of ingredient(s) with unknown acute dermal toxicity: 2.5 %

The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 2.5 %

The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 2.5 %

### Other hazards which do not result in classification

Contact with dust can cause mechanical irritation or drying of the skin.

May form explosive dust-air mixture during processing, handling or other means.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

### Components

Chemical name	CAS-No.	Concentration (% w/w)
Citric acid	77-92-9	>= 30 - < 50
Starch	9005-25-8	>= 20 - < 30
Ascorbic acid	50-81-7	>= 5 - < 10
(dl)-a-Tocopheryl acetate	7695-91-2	>= 1 - < 5
Dimethyl octadienol	78-70-6	>= 0.1 - < 0.25
3,7-Dimethyl 2,6-octadienal	5392-40-5	>= 0.1 - < 0.25
Cyanocobalamin	68-19-9	>= 0.0002 - < 0.0025

## 4. FIRST AID MEASURES

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General advice	: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	: If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of skin contact	: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
In case of eye contact	: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.
If swallowed	: If swallowed, DO NOT induce vomiting. Get medical attention if symptoms occur. Rinse mouth thoroughly with water.
Most important symptoms and effects, both acute and delayed	: Causes serious eye irritation. May cause respiratory irritation. Contact with dust can cause mechanical irritation or drying of the skin.
Protection of first-aiders	: First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
Notes to physician	: Treat symptomatically and supportively.

## 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Water spray Alcohol-resistant foam Carbon dioxide (CO <sub>2</sub> ) Dry chemical
Unsuitable extinguishing media	: None known.
Specific hazards during fire-fighting	: Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Exposure to combustion products may be a hazard to health.
Hazardous combustion products	: Carbon oxides Nitrogen oxides (NO <sub>x</sub> ) Chlorine compounds
Specific extinguishing methods	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment	: In the event of fire, wear self-contained breathing apparatus.

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for firefighters

Use personal protective equipment.

## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions : Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Surround spill with absorbents and place a damp covering over the area to minimise entry of the material into the air. Add excess liquid to allow the material to enter into solution. Soak up with inert absorbent material. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## 7. HANDLING AND STORAGE

Technical measures : Static electricity may accumulate and ignite suspended dust causing an explosion. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.

Advice on safe handling : Do not get on skin or clothing. Avoid breathing dust. Do not swallow. Do not get in eyes. Wash skin thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Keep container tightly closed. Already sensitised individuals, and those susceptible to asthma, allergies, chronic or recurrent respiratory disease, should consult their physician regarding working with respira-

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	<p>tory irritants or sensitizers.</p> <p>Minimize dust generation and accumulation.</p> <p>Keep container closed when not in use.</p> <p>Keep away from heat and sources of ignition.</p> <p>Take precautionary measures against static discharges.</p> <p>Take care to prevent spills, waste and minimize release to the environment.</p>
Conditions for safe storage	<p>: Keep in properly labelled containers.</p> <p>Store locked up.</p> <p>Keep tightly closed.</p> <p>Keep in a cool, well-ventilated place.</p> <p>Store in accordance with the particular national regulations.</p>
Materials to avoid	<p>: Do not store with the following product types:</p> <p>Strong oxidizing agents</p>

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parame- ters / Permissible concentration	Basis
Starch	9005-25-8	TWA	10 mg/m <sup>3</sup>	ACGIH
Ascorbic acid	50-81-7	TWA	5000 µg/m <sup>3</sup> (OEB 1)	Internal
(dl)-a-Tocopheryl acetate	7695-91-2	TWA	5000 µg/m <sup>3</sup> (OEB 1)	Internal
3,7-Dimethyl 2,6-octadienal	5392-40-5	TWA (Inhal- able fraction and vapor)	5 ppm	ACGIH
Cyanocobalamin	68-19-9	TWA	15 µg/m <sup>3</sup> (OEB 3)	Internal
		Wipe limit	150 µg/100 cm <sup>2</sup>	Internal

### Engineering measures

: All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices). Minimize open handling.

### Personal protective equipment

Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type : Combined particulates and organic vapour type

Hand protection

Material : Chemical-resistant gloves

Remarks : Consider double gloving.

Eye protection : Wear safety glasses with side shields or goggles.

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	<p>If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.</p>
Skin and body protection	<p>: Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.</p>
Hygiene measures	<p>: If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.</p>

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: powder
Colour	: white
Odour	: No data available
Odour Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: No data available
Flash point	: Not applicable
Evaporation rate	: Not applicable
Flammability (solid, gas)	: May form explosive dust-air mixture during processing, handling or other means.
Flammability (liquids)	: Not applicable
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available

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Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Relative density	:	No data available
Density	:	No data available
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle characteristics		
Particle size	:	No data available

## 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: May form explosive dust-air mixture during processing, handling or other means. Can react with strong oxidizing agents.
Conditions to avoid	: Heat, flames and sparks. Avoid dust formation.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

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## 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation  
Skin contact  
Ingestion  
Eye contact

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### Acute toxicity

Not classified based on available information.

### Components:

#### **Citric acid:**

Acute oral toxicity : LD50 (Mouse): 5,400 mg/kg  
Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

#### **Starch:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

#### **Ascorbic acid:**

Acute oral toxicity : LD50 (Rat): 11,900 mg/kg

#### **(dl)-a-Tocopheryl acetate:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Acute dermal toxicity : LD50 (Rat): > 3,000 mg/kg  
Assessment: The substance or mixture has no acute dermal toxicity

#### **Dimethyl octadienol:**

Acute oral toxicity : LD50 (Rat): 2,790 mg/kg  
Method: OECD Test Guideline 401  
Remarks: The test was conducted equivalent or similar to guideline  
Acute inhalation toxicity : LC50 (Mouse): > 3.2 mg/l  
Exposure time: 90 min  
Test atmosphere: vapour  
Remarks: No test guideline followed  
Acute dermal toxicity : LD50 (Rabbit): 5,610 mg/kg  
Method: OECD Test Guideline 402  
Remarks: The test was conducted equivalent or similar to guideline

#### **3,7-Dimethyl 2,6-octadienal:**

Acute oral toxicity : LD50 (Rat, female): 4,895 mg/kg  
Acute inhalation toxicity : LC50 (Rat): > 0.68 mg/l  
Exposure time: 7 h  
Test atmosphere: vapour

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Acute dermal toxicity : LD50 (Rabbit): 2,250 mg/kg

### **Cyanocobalamin:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

### **Skin corrosion/irritation**

Not classified based on available information.

### **Components:**

#### **Citric acid:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

#### **Ascorbic acid:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

#### **(dl)-a-Tocopheryl acetate:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

#### **Dimethyl octadienol:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : Skin irritation  
Remarks : The test was conducted according to guideline

#### **3,7-Dimethyl 2,6-octadienal:**

Species : Rabbit  
Result : Skin irritation

### **Serious eye damage/eye irritation**

Causes serious eye irritation.

### **Components:**

#### **Citric acid:**

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : Irritation to eyes, reversing within 21 days

#### **Starch:**

Species : Rabbit  
Result : No eye irritation

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## Ascorbic acid:

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : No eye irritation

### **(dl)- $\alpha$ -Tocopheryl acetate:**

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : No eye irritation

## **Dimethyl octadienol:**

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : Irritation to eyes, reversing within 21 days  
Remarks : The test was conducted equivalent or similar to guideline

### 3,7-Dimethyl 2,6-octadienal:

Species : Rabbit  
Result : Irritation to eyes, reversing within 21 days

## **Respiratory or skin sensitisation**

## **Skin sensitisation**

Not classified based on ava

## Respiratory sensitisation

Not classified b

## Compo

**Starch:**  
Test Type : Maximisation Test  
Exposure routes : Skin contact  
Species : Guinea pig  
Result : negative

## Ascorbic acid-

Test Type : Maurer optimisation test  
Exposure routes : Skin contact  
Species : Guinea pig  
Result : negative

### (dl)- $\alpha$ -Tocopheryl acetate

Test Type : Draize Test  
Exposure routes : Skin contact  
Species : Humans  
Result : negative

### Dimethyl octadienol:

Test Type : Local lymph node assay (LLNA)

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Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	positive
Remarks	:	The test was conducted according to guideline
Assessment	:	Probability or evidence of low to moderate skin sensitisation rate in humans

### 3,7-Dimethyl 2,6-octadienal:

Test Type	:	Human repeat insult patch test (HRIPT)
Exposure routes	:	Skin contact
Result	:	positive

Assessment : Probability or evidence of skin sensitisation in humans

### Germ cell mutagenicity

Not classified based on available information.

### Components:

#### Citric acid:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: in vitro micronucleus test Result: positive
		Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Genotoxicity in vivo	:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Rat Application Route: Ingestion Result: negative

#### Starch:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
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#### Ascorbic acid:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: In vitro mammalian cell gene mutation test Result: negative

Test Type: Chromosome aberration test in vitro  
Result: negative

Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo
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cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Result: negative

### (dl)-a-Tocopheryl acetate:

Genotoxicity in vitro

: Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo

: Test Type: Mammalian erythrocyte micronucleus test (in vivo  
cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Result: negative

### Dimethyl octadienol:

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative  
Remarks: The test was conducted equivalent or similar to  
guideline

Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative  
Remarks: The test was conducted equivalent or similar to  
guideline

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: The test was conducted equivalent or similar to  
guideline

Genotoxicity in vivo

: Test Type: Mammalian erythrocyte micronucleus test (in vivo  
cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: The test was conducted according to guideline

### 3,7-Dimethyl 2,6-octadienol:

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

Test Type: In vitro mammalian cell gene mutation test

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Method: OECD Test Guideline 476  
Result: negative

Test Type: Chromosome aberration test in vitro  
Result: negative

Test Type: In vitro sister chromatid exchange assay in mammalian cells  
Result: positive

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Result: negative

### **Cyanocobalamin:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

### **Carcinogenicity**

Not classified based on available information.

### **Components:**

#### **Ascorbic acid:**

Species : Mouse  
Application Route : Ingestion  
Exposure time : 2 Years  
Result : negative

#### **(dl)-a-Tocopheryl acetate:**

Species : Rat  
Application Route : Ingestion  
Exposure time : 104 weeks  
Result : negative

#### **3,7-Dimethyl 2,6-octadienal:**

Species : Mouse  
Application Route : Ingestion  
Exposure time : 104 - 105 weeks  
Result : negative

### **Reproductive toxicity**

Not classified based on available information.

### **Components:**

#### **Citric acid:**

Effects on foetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat

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Application Route: Ingestion  
Result: negative

### Ascorbic acid:

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative

### (dl)-a-Tocopheryl acetate:

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Result: negative

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rabbit  
Application Route: Ingestion  
Result: negative

### Dimethyl octadienol:

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: No test guideline followed

### 3,7-Dimethyl 2,6-octadienal:

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 443  
Result: negative

Effects on foetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 443  
Result: negative

### STOT - single exposure

May cause respiratory irritation.

### Components:

#### Citric acid:

Assessment : May cause respiratory irritation.

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## STOT - repeated exposure

Not classified based on available information.

## Repeated dose toxicity

## Components:

### Citric acid:

Species : Rat  
NOAEL : 4,000 mg/kg  
LOAEL : 8,000 mg/kg  
Application Route : Ingestion  
Exposure time : 10 Days

## Starch:

Species : Rat  
NOAEL : >= 2,000 mg/kg  
Application Route : Skin contact  
Exposure time : 28 Days  
Method : OECD Test Guideline 410

### Ascorbic acid:

Species : Rat, male  
NOAEL :  $\geq 8,100$  mg/kg  
Application Route : Ingestion  
Exposure time : 13 Weeks

### (dl)- $\alpha$ -Tocopheryl acetate:

Species : Rat  
NOAEL : 500 mg/kg  
Application Route : Ingestion  
Exposure time : 90 Days

## Dimethyl octadienol:

Species : Rat, male  
NOAEL :  $\geq 497.9$  mg/kg  
Application Route : Ingestion  
Exposure time : 96 Days  
Method : OECD Test Guideline 408  
Remarks : The test was conducted according to guideline

Species : Rat  
NOAEL : 250 mg/kg  
Application Route : Skin contact  
Exposure time : 91 Days  
Method : OECD Test Guideline 411  
Remarks : The test was conducted equivalent or similar to guideline

### 3,7-Dimethyl 2,6-octadienal:

Species : Rat, female  
LOAEL : 335 mg/kg

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Application Route : Ingestion  
Exposure time : 14 Weeks

### Aspiration toxicity

Not classified based on available information.

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## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Components:

##### **Citric acid:**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1,535 mg/l  
Exposure time: 24 h

##### **Ascorbic acid:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1,020 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to microorganisms : EC50: 140 mg/l  
Exposure time: 16 h  
Method: DIN 38 412 Part 8

##### **(dl)-a-Tocopheryl acetate:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 ( Pseudokirchneriella subcapitata (green algae)): > 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC ( Pseudokirchneriella subcapitata (green algae)): >= 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 927 mg/l  
Exposure time: 30 min  
Method: ISO 8192

# SAFETY DATA SHEET

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Toxicity to fish (Chronic toxicity) : NOEC: 100 mg/l  
Exposure time: 28 d  
Species: *Oncorhynchus mykiss* (rainbow trout)

### Dimethyl octadienol:

Toxicity to fish : LC50 (*Oncorhynchus mykiss* (rainbow trout)): 27.8 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: The test was conducted according to guideline

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 59 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: The test was conducted according to guideline

Toxicity to algae/aquatic plants : ErC50 (*Desmodesmus subspicatus* (green algae)): 156.7 mg/l  
Exposure time: 96 h  
EC10 (*Desmodesmus subspicatus* (green algae)): 54.3 mg/l  
Exposure time: 96 h

Toxicity to microorganisms : EC10 (activated sludge): > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
Remarks: The test was conducted according to guideline

### 3,7-Dimethyl 2,6-octadienal:

Toxicity to fish : LC50 (*Leuciscus idus* (Golden orfe)): 6.78 mg/l  
Exposure time: 96 h  
Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 6.8 mg/l  
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (*Desmodesmus subspicatus* (green algae)): 103.8 mg/l  
Exposure time: 72 h  
EC10 (*Desmodesmus subspicatus* (green algae)): 3 mg/l  
Exposure time: 72 h

Toxicity to microorganisms : EC50 (activated sludge): 160 mg/l  
Exposure time: 30 min  
Method: OECD Test Guideline 209

### Cyanocobalamin:

Toxicity to fish : LC50 (*Oncorhynchus mykiss* (rainbow trout)): > 1 - 10 mg/l  
Exposure time: 14 d  
Remarks: Based on data from similar materials

Toxicity to daphnia and other : EC50 (*Ceriodaphnia dubia* (water flea)): > 10 - 100 mg/l

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aquatic invertebrates	Exposure time: 48 h Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: EC50 ( <i>Champia parvula</i> (marine algae)): > 0.1 - 1 mg/l Exposure time: 72 h Remarks: Based on data from similar materials
	EC10 ( <i>Lemma minor</i> (common duckweed)): > 0.1 - 1 mg/l Exposure time: 7 d Remarks: Based on data from similar materials
M-Factor (Acute aquatic toxicity)	: 1
Toxicity to fish (Chronic toxicity)	: NOEC: > 1 mg/l Exposure time: 16 d Species: <i>Danio rerio</i> (zebra fish) Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: > 0.1 - 1 mg/l Exposure time: 28 d Species: <i>Daphnia magna</i> (Water flea) Remarks: Based on data from similar materials

### Persistence and degradability

#### Components:

##### **Citric acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 97 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

##### **Ascorbic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 97 %  
Exposure time: 5 d  
Method: OECD Test Guideline 302

##### **(dl)-a-Tocopheryl acetate:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 21.7 - 31 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C

##### **Dimethyl octadienol:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 64.2 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D  
Remarks: The test was conducted according to guideline

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### 3,7-Dimethyl 2,6-octadienal:

Biodegradability : Result: Readily biodegradable.  
Biodegradation: > 90 %  
Exposure time: 28 d  
Method: Directive 67/548/EEC Annex V, C.4.D.

## Bioaccumulative potential

## Components:

### Citric acid:

Partition coefficient: n-octanol/water : log Pow: -1.72

### Ascorbic acid:

Partition coefficient: n-octanol/water : log Pow: -1.85

### **Dimethyl octadienol:**

Partition coefficient: n-octanol/water : log Pow: 2.84  
Method: OECD Test Guideline 107  
Remarks: The test was conducted equivalent or similar to guideline

### 3,7-Dimethyl 2,6-octadienal:

Partition coefficient: n-octanol/water : log Pow: 2.76

## Mobility in soil

No data available

## Other adverse effects

No data available

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## 13. DISPOSAL CONSIDERATIONS

## Disposal methods

Waste from residues : Do not dispose of waste into sewer.  
Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

## **14. TRANSPORT INFORMATION**

## International Regulations

UNRTDG

Not regulated as a dangerous good

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### IATA-DGR

Not regulated as a dangerous good

### IMDG-Code

Not regulated as a dangerous good

### Transport in bulk according to IMO instruments

Not applicable for product as supplied.

### Special precautions for user

Not applicable

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## 15. REGULATORY INFORMATION

### Safety, health and environmental regulations/legislation specific for the substance or mixture

#### The components of this product are reported in the following inventories:

AICS : not determined

DSL : not determined

IECSC : not determined

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## 16. OTHER INFORMATION

Revision Date : 11.09.2025

#### Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Date format : dd.mm.yyyy

#### Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

ACGIH / TWA : 8-hour, time-weighted average

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Con-

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centration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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