

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### SECTION 1. IDENTIFICATION

Product name : Vitamin C (>10%) Formulation  
Product code : AQUA C FISH PLUS

#### Manufacturer or supplier's details

Company name of supplier : Merck & Co., Inc  
Address : 126 E. Lincoln Avenue  
Rahway, New Jersey U.S.A. 07065  
Telephone : 908-740-4000  
Emergency telephone : 1-908-423-6000  
E-mail address : EHSDATASTEWARD@merck.com

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

Recommended use : Veterinary product  
Restrictions on use : Not applicable

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Combustible dust

Serious eye damage : Category 1

Skin sensitization : Category 1

#### Other hazards

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

#### GHS label elements

Hazard pictograms	:	
Signal Word	:	Danger
Hazard Statements	:	If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H335 May cause respiratory irritation.
Supplemental Hazard Statements	:	Corrosive to the respiratory tract.
Precautionary Statements	:	<b>Prevention:</b> P261 Avoid breathing dust.

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P271 Use only outdoors or in a well-ventilated area.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves, eye protection and face protection.

### Response:

P302 + P352 IF ON SKIN: Wash with plenty of water.  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.  
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER.  
P333 + P313 If skin irritation or rash occurs: Get medical attention.  
P362 + P364 Take off contaminated clothing and wash it before reuse.

### Storage:

P405 Store locked up.

### Disposal:

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

### Additional Labeling

The following percentage of the mixture consists of ingredient(s) with unknown acute oral toxicity: 1.25 %  
The following percentage of the mixture consists of ingredient(s) with unknown acute dermal toxicity: 1.25 %  
The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 1.25 %

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

### Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Starch	9005-25-8*	>= 30 - <= 60	TSC
Citric acid	77-92-9*	>= 10 - <= 30	TSC
Ascorbic acid	50-81-7*	>= 7 - <= 13	TSC
Calcium diformate	544-17-2*	>= 3 - <= 7	TSC
Phosphoric acid	7664-38-2*	>= 0.5 - <= 1.5	TSC
Formic acid	64-18-6*	>= 0.1 - <= 1	TSC

# SAFETY DATA SHEET

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Version 3.0      Revision Date: 06/18/2025      SDS Number: 11506187-00003      Date of last issue: 04/14/2025  
Date of first issue: 02/03/2025

Dimethyl octadienol	78-70-6*	>= 0.1 - <= 1	TSC
3,7-Dimethyl 2,6-octadienal	5392-40-5*	>= 0.1 - <= 1	TSC

\* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

### SECTION 4. FIRST AID MEASURES

- 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.  
Thoroughly clean shoes 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 immediately.
- 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 : Contact with dust can cause mechanical irritation or drying of the skin.  
May cause an allergic skin reaction.  
Causes serious eye damage.  
May cause respiratory irritation.  
Corrosive to the respiratory tract.
- 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.

### SECTION 5. FIRE-FIGHTING 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.

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

- Exposure to combustion products may be a hazard to health.
- Hazardous combustion products : Carbon oxides  
Metal oxides  
Oxides of phosphorus
- 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 for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

### SECTION 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 minimize 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.

### SECTION 7. HANDLING AND STORAGE

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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



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Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

- |                             |   |  |
|-----------------------------|---|--|
| Local/Total ventilation     | : | and bonding, or inert atmospheres.<br>If sufficient ventilation is unavailable, use with local exhaust ventilation.  |
| Advice on safe handling     | : | Do not get on skin or clothing.<br>Avoid breathing dust.<br>Do not swallow.<br>Do not get in eyes.<br>Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment<br>Keep container tightly closed.<br>Already sensitized individuals, and those susceptible to asthma, allergies, chronic or recurrent respiratory disease, should consult their physician regarding working with respiratory irritants or sensitizers.<br>Minimize dust generation and accumulation.<br>Keep container closed when not in use.<br>Keep away from heat and sources of ignition.<br>Take precautionary measures against static discharges.<br>Take care to prevent spills, waste and minimize release to the environment. |
| Conditions for safe storage | : | Keep in properly labeled containers.<br>Store locked up.<br>Keep tightly closed.<br>Keep in a cool, well-ventilated place.<br>Store in accordance with the particular national regulations.  |
| Materials to avoid          | : | Do not store with the following product types:<br>Strong oxidizing agents  |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

- |                                      |   |
|--------------------------------------|---|
| inert or nuisance dust               | 50 Million particles per cubic foot<br>Value type (Form of exposure): TWA (total dust)<br>Basis: OSHA Z-3<br><br>15 mg/m <sup>3</sup><br>Value type (Form of exposure): TWA (total dust)<br>Basis: OSHA Z-3<br><br>5 mg/m <sup>3</sup><br>Value type (Form of exposure): TWA (respirable fraction)<br>Basis: OSHA Z-3<br><br>15 Million particles per cubic foot<br>Value type (Form of exposure): TWA (respirable fraction)<br>Basis: OSHA Z-3 |
| Dust, nuisance dust and particulates | 10 mg/m <sup>3</sup><br>Value type (Form of exposure): PEL (Total dust)<br>Basis: CAL PEL   |

# SAFETY DATA SHEET

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## Vitamin C (>10%) Formulation

Version 3.0      Revision Date: 06/18/2025      SDS Number: 11506187-00003      Date of last issue: 04/14/2025  
Date of first issue: 02/03/2025

5 mg/m<sup>3</sup>

Value type (Form of exposure): PEL (respirable dust fraction)

Basis: CAL PEL

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Starch	9005-25-8	TWA	10 mg/m <sup>3</sup>	ACGIH
		TWA (Respirable)	5 mg/m <sup>3</sup>	NIOSH REL
		TWA (total)	10 mg/m <sup>3</sup>	NIOSH REL
		TWA (total dust)	15 mg/m <sup>3</sup>	OSHA Z-1
		TWA (respirable fraction)	5 mg/m <sup>3</sup>	OSHA Z-1
Ascorbic acid	50-81-7	TWA	5000 µg/m <sup>3</sup> (OEB 1)	Internal
Phosphoric acid	7664-38-2	TWA	1 mg/m <sup>3</sup>	ACGIH
		STEL	3 mg/m <sup>3</sup>	ACGIH
		TWA	1 mg/m <sup>3</sup>	NIOSH REL
		ST	3 mg/m <sup>3</sup>	NIOSH REL
		TWA	1 mg/m <sup>3</sup>	OSHA Z-1
Formic acid	64-18-6	TWA	5 ppm	ACGIH
		TWA	5 ppm 9 mg/m <sup>3</sup>	NIOSH REL
		TWA	5 ppm 9 mg/m <sup>3</sup>	OSHA Z-1
3,7-Dimethyl 2,6-octadienal	5392-40-5	TWA (Inhalable fraction and vapor)	5 ppm	ACGIH

### 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 : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

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according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### Hand protection

Material : Chemical-resistant gloves

Remarks : Consider double gloving.  
Eye protection : Wear safety glasses with side shields or goggles.  
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.

Skin and body protection : 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.

Hygiene measures : 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.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : powder

Color : No data available

Odor : No data available

Odor 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.

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Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Flammability (liquids)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	Not applicable
Relative vapor 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
Autoignition 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

### SECTION 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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Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### SECTION 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

Inhalation  
Skin contact  
Ingestion  
Eye contact

#### Acute toxicity

Not classified based on available information.

#### Product:

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: > 200 mg/l Exposure time: 4 h Test atmosphere: vapor Method: Calculation method

#### Components:

##### Starch:

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

##### 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

##### Ascorbic acid:

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

Acute oral toxicity	:	LD50 (Rat): > 2,000 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 Remarks: Based on data from similar materials

##### Phosphoric acid:

Acute oral toxicity	:	LD50 (Rat): 2,000 mg/kg Method: OECD Test Guideline 423
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3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Acute inhalation toxicity : Assessment: Corrosive to the respiratory tract.

### Formic acid:

Acute oral toxicity : Acute toxicity estimate (Humans): 500 mg/kg  
Method: Expert judgment

Acute inhalation toxicity : LC50 (Rat): 7.4 mg/l  
Exposure time: 4 h  
Test atmosphere: vapor  
Assessment: Corrosive to the respiratory tract.

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Remarks: Based on data from similar materials

### 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: vapor  
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: vapor

Acute dermal toxicity : LD50 (Rabbit): 2,250 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:

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

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

### Calcium diformate:

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

### Phosphoric acid:

Result	: Corrosive after 3 minutes to 1 hour of exposure
Remarks	: Based on national or regional regulation.

### Formic acid:

Result	: Corrosive after 3 minutes or less of exposure
Remarks	: Based on extreme pH

### 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 damage.

### Components:

#### Starch:

Species	: Rabbit
Result	: No eye irritation

#### Citric acid:

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

#### Ascorbic acid:

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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### Calcium diformate:

Species	: Rabbit
Result	: Irreversible effects on the eye
Method	: OECD Test Guideline 405

### Phosphoric acid:

Species	: Rabbit
Result	: Irreversible effects on the eye

### Formic acid:

Result	: Irreversible effects on the eye
Remarks	: Based on skin corrosivity.

### Dimethyl octadienol:

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

#### Skin sensitization

May cause an allergic skin reaction.

#### Respiratory sensitization

Not classified based on available information.

### Components:

#### Starch:

Test Type	: Maximization Test
Routes of exposure	: Skin contact
Species	: Guinea pig
Result	: negative

#### Ascorbic acid:

Test Type	: Maurer optimisation test
Routes of exposure	: Skin contact
Species	: Guinea pig
Result	: negative

#### Calcium diformate:

Test Type	: Maximization Test
Routes of exposure	: Skin contact
Species	: Guinea pig

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Method	: OECD Test Guideline 406
Result	: negative
Remarks	: Based on data from similar materials

### Formic acid:

Test Type	: Buehler Test
Routes of exposure	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

### Dimethyl octadienol:

Test Type	: Local lymph node assay (LLNA)
Routes of exposure	: 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 sensitization rate in humans
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### 3,7-Dimethyl 2,6-octadienal:

Test Type	: Human repeat insult patch test (HRIPT)
Routes of exposure	: Skin contact
Result	: positive

Assessment	: Probability or evidence of skin sensitization in humans
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### Germ cell mutagenicity

Not classified based on available information.

### Components:

#### Starch:

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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Application Route: Ingestion  
Result: negative

### 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 cytogenetic assay) Species: Mouse Application Route: Ingestion Result: negative

### Calcium diformate:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	: Test Type: Sex-linked recessive lethal test in Drosophila melanogaster (in vivo) Application Route: Ingestion Result: negative Remarks: Based on data from similar materials

### Phosphoric acid:

Genotoxicity in vitro	: Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative
	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative
	Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative

### Formic acid:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	: Test Type: Sex-linked recessive lethal test in Drosophila melanogaster (in vivo) Application Route: Ingestion

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Method: OECD Test Guideline 477  
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-octadienal:

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

Test Type: In vitro mammalian cell gene mutation test  
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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### Carcinogenicity

Not classified based on available information.

### Components:

#### Ascorbic acid:

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

#### Formic acid:

Species	: Rat
Application Route	: Ingestion
Exposure time	: 104 weeks
Result	: negative
Remarks	: Based on data from similar materials

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

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

**IARC** No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

### Reproductive toxicity

Not classified based on available information.

### Components:

#### Citric acid:

Effects on fetal development	: Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative
------------------------------	---

#### Ascorbic acid:

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

#### Calcium diformate:



# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Effects on fertility : Test Type: Two-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 416  
Result: negative  
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rabbit  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative  
Remarks: Based on data from similar materials

### Phosphoric acid:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

Effects on fetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

### Formic acid:

Effects on fertility : Test Type: Two-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 416  
Result: negative  
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rabbit  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative  
Remarks: Based on data from similar materials

### Dimethyl octadienol:

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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### 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 fetal 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.  
Corrosive to the respiratory tract.

### Components:

#### Citric acid:

Assessment : May cause respiratory irritation.

### STOT-repeated exposure

Not classified based on available information.

### Repeated dose toxicity

### Components:

#### Starch:

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

#### Citric acid:

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

#### Ascorbic acid:

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

#### Calcium diformate:

Species : Rat

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

NOAEL	: 3,000 mg/kg
Application Route	: Ingestion
Exposure time	: 13 Weeks
Method	: OECD Test Guideline 408
Remarks	: Based on data from similar materials

### Phosphoric acid:

Species	: Rat
NOAEL	: 250 mg/kg
Application Route	: Ingestion
Exposure time	: 40 - 52 Days
Method	: OECD Test Guideline 422

### Formic acid:

Species	: Rat
NOAEL	: 400 mg/kg
Application Route	: Ingestion
Exposure time	: 52 Weeks
Remarks	: Based on data from similar materials

### Dimethyl octadienol:

Species	: Rat, male
NOAEL	: >= 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
Application Route	: Ingestion
Exposure time	: 14 Weeks

### Aspiration toxicity

Not classified based on available information.

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### SECTION 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

##### **Calcium diformate:**

Toxicity to fish	:	LC0 (Danio rerio (zebra fish)): >= 1,000 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h Method: EPA-660/3-75-009 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l Exposure time: 72 h Remarks: Based on data from similar materials  NOEC (Pseudokirchneriella subcapitata (green algae)): 500 mg/l Exposure time: 72 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 100 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: Based on data from similar materials
Toxicity to microorganisms	:	NOEC: >= 22.1 mg/l Exposure time: 28 d Remarks: Based on data from similar materials

##### **Phosphoric acid:**

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Toxicity to fish	: LC50 (Oryzias latipes (Japanese medaka)): > 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 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201  NOEC (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	: EC50: > 100 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Based on data from similar materials

### Formic acid:

Toxicity to fish	: LC50 (Danio rerio (zebra fish)): 130 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 365 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: ErC50 (Pseudokirchneriella subcapitata (green algae)): 1,240 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials  EC10 (Pseudokirchneriella subcapitata (green algae)): 295 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 21 d Method: OECD Test Guideline 211
Toxicity to microorganisms	: NOEC: 72 mg/l Exposure time: 13 d

### Dimethyl octadienol:

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

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

### Persistence and degradability

#### Components:

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

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

Biodegradability	: Result: Readily biodegradable. Biodegradation: 97 %
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# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Exposure time: 5 d  
Method: OECD Test Guideline 302

### Calcium diformate:

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 86 %  
Exposure time: 28 d  
Method: OECD Test Guideline 306  
Remarks: Based on data from similar materials

### Formic acid:

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 100 %  
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

### 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

##### Calcium diformate:

Partition coefficient: n-octanol/water : log Pow: -2.3 - -1.9  
Remarks: Based on data from similar materials

##### Formic acid:

Partition coefficient: n-octanol/water : log Pow: -2.1

##### Dimethyl octadienol:

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

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

## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal methods

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

## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### UNRTDG

Not regulated as a dangerous good

#### 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.

### Domestic regulation

#### 49 CFR

Not regulated as a dangerous good

### Special precautions for user

Not applicable

## SECTION 15. REGULATORY INFORMATION

### CERCLA Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ



# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Combustible dust  
Respiratory or skin sensitization  
Serious eye damage or eye irritation

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

### US State Regulations

#### Pennsylvania Right To Know

Starch	9005-25-8
Citric acid	77-92-9
D(+)-Glucose monohydrate	5996-10-1
Ascorbic acid	50-81-7
Calcium diformate	544-17-2
Phosphoric acid	7664-38-2
Fumaric acid	110-17-8
Formic acid	64-18-6

#### California List of Hazardous Substances

Phosphoric acid	7664-38-2
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#### California Permissible Exposure Limits for Chemical Contaminants

Starch	9005-25-8
Phosphoric acid	7664-38-2

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

AICS	: not determined
DSL	: not determined
IECSC	: not determined

## SECTION 16. OTHER INFORMATION

### Further information

# SAFETY DATA SHEET

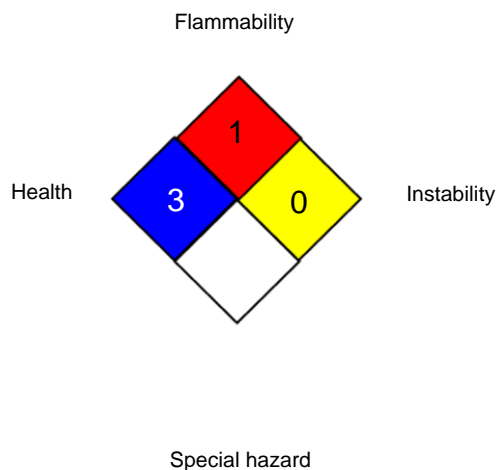
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## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

### NFPA 704:



### HMIS® IV:

HEALTH	/	3
FLAMMABILITY		3
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "\*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

### Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
CAL PEL	: California permissible exposure limits for chemical contaminants (Title 8, Article 107)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	: USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
CAL PEL / PEL	: Permissible exposure limit
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	: STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA	: 8-hour time weighted average
OSHA Z-3 / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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; HMIS - Hazardous Materials Identification System; 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

# SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



## Vitamin C (>10%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/14/2025
3.0	06/18/2025	11506187-00003	Date of first issue: 02/03/2025

Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; 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

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

Revision Date : 06/18/2025

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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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