

# SAFETY DATA SHEET



## Vitamin C (>10%) Formulation

Version  
2.0

Revision Date:  
2025/04/14

SDS Number:  
11506182-00002

Date of last issue: 2025/02/03  
Date of first issue: 2025/02/03

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### 1. PRODUCT AND COMPANY IDENTIFICATION

Chemical product name : Vitamin C (>10%) Formulation

Product code : AQUA C FISH PLUS

#### Supplier's company name, address and phone number

Company name of supplier : MSD

Address : 1-13-12, Kudan-kita, Chiyoda-ku, Tokyo, Japan

Telephone : 03-6272-1099

E-mail address : EHSDATASTEWARD@msd.com

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

#### 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

#### GHS classification of chemical product

Serious eye damage/eye irritation : Category 1

Specific target organ toxicity - single exposure : Category 3

#### GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H318 Causes serious eye damage.  
H335 May cause respiratory irritation.

Precautionary statements : **Prevention:**

P261 Avoid breathing dust.  
P271 Use only outdoors or in a well-ventilated area.  
P280 Wear eye protection/ face protection.

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### **Response:**

P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ 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/ doctor.

### **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: 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 %

The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 1.25 %

### **Other hazards which do not result in classification**

Important symptoms and out- : Contact with dust can cause mechanical irritation or drying of lines of the emergency as- the skin.  
sumed May form explosive dust-air mixture during processing, han-  
dling or other means.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

### **Components**

Chemical name	CAS-No.	Concentration (% w/w)	ENCS No.
Starch	9005-25-8	>= 40 - < 50	8-98
Citric acid	77-92-9	>= 20 - < 30	2-1318
Ascorbic acid	50-81-7	>= 10 - < 20	5-62
Calcium diformate	544-17-2	>= 3 - < 10	2-676
Phosphoric acid	7664-38-2	>= 1 - < 10	1-422
Formic acid	64-18-6	>= 0.1 - < 1	2-670

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3,7-Dimethyl 2,6-octadienal	5392-40-5	>= 0.1 - < 1	2-515
Dimethyl octadienol	78-70-6	>= 0.1 - < 1	2-258, 2-249
2,6-Di-tert-butyl-p-cresol	128-37-0	>= 0.0025 - < 0.025	3-540, 9-1805

### 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.

In case of eye contact : Thoroughly clean shoes before reuse.  
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.  
Causes serious eye damage.  
May cause respiratory irritation.

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.

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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 firefighters	: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

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## 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.

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## 7. HANDLING AND STORAGE

### Handling

Technical measures	: Static electricity may accumulate and ignite suspended dust causing an explosion.
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Local/Total ventilation	Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Advice on safe handling	<ul style="list-style-type: none"><li>: If sufficient ventilation is unavailable, use with local exhaust ventilation.</li><li>: Do not get on skin or clothing.</li><li>Avoid breathing dust.</li><li>Do not swallow.</li><li>Do not get in eyes.</li></ul> <p>Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment</p> <p>Keep container tightly closed.</p> <p>Already sensitised individuals, and those susceptible to asthma, allergies, chronic or recurrent respiratory disease, should consult their physician regarding working with respiratory irritants or sensitisers.</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>
Avoidance of contact	<ul style="list-style-type: none"><li>: Oxidizing agents</li></ul>
Hygiene measures	<ul style="list-style-type: none"><li>: If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.</li><li>When using do not eat, drink or smoke.</li><li>Contaminated work clothing should not be allowed out of the workplace.</li><li>Wash contaminated clothing before re-use.</li><li>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.</li></ul>

### Storage

Conditions for safe storage	<ul style="list-style-type: none"><li>: Keep in properly labelled containers.</li><li>Store locked up.</li><li>Keep tightly closed.</li><li>Keep in a cool, well-ventilated place.</li><li>Store in accordance with the particular national regulations.</li></ul>
Materials to avoid	<ul style="list-style-type: none"><li>: Do not store with the following product types:</li><li>Strong oxidizing agents</li></ul>
Packaging material	<ul style="list-style-type: none"><li>: Unsuitable material: None known.</li></ul>

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Threshold limit value and permissible exposure limits for each component in the work environment**

Components	CAS-No.	Value type	Control param-	Basis
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		(Form of exposure)	ters / Concentration standard / Permissible concentration	
Starch	9005-25-8	TWA	10 mg/m3	ACGIH
Ascorbic acid	50-81-7	TWA	5000 µg/m3 (OEB 1)	Internal
Phosphoric acid	7664-38-2	OEL-M	1 mg/m3	JP OEL JSOH
		8h-OEL-M	1 mg/m3	JP ISHL OEL 577-2(2)
		TWA	1 mg/m3	ACGIH
		STEL	3 mg/m3	ACGIH
Formic acid	64-18-6	OEL-M	5 ppm 9.4 mg/m3	JP OEL JSOH
		TWA	5 ppm	ACGIH
3,7-Dimethyl 2,6-octadienal	5392-40-5	TWA (Inhalable fraction and vapor)	5 ppm	ACGIH
2,6-Di-tert-butyl-p-cresol	128-37-0	8h-OEL-M	10 mg/m3	JP ISHL OEL 577-2(2)
		TWA (Inhalable fraction and vapor)	2 mg/m3	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 : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type

: Combined particulates, acidic and inorganic gas/vapour type

Hand protection

Material

: Chemical-resistant gloves

Remarks

: Consider double gloving.  
Impermeable protective gloves

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

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**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.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : powder

Colour : No data available

Odour : No data available

Odour Threshold : No data available

Melting point/freezing point : No data available

Boiling point, initial boiling point and boiling range : No data available

Flammability (solid, gas) : May form explosive dust-air mixture during processing, handling or other means.

Flammability (liquids) : Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

Flash point : Not applicable

Decomposition temperature : No data available

pH : No data available

Evaporation rate : Not applicable

Auto-ignition temperature : No data available

Viscosity

Viscosity, kinematic : Not applicable

Solubility(ies)

Water solubility : No data available

Partition coefficient: n-octanol/water : Not applicable

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Vapour pressure : Not applicable

Density and / or relative density  
Relative density : No data available

Density : No data available

Relative vapour density : 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

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## 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

### Acute toxicity

Not classified based on available information.

#### Product:

Acute oral toxicity : Acute toxicity estimate: > 2,000 mg/kg  
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 20 mg/l  
Exposure time: 4 h

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Test atmosphere: vapour  
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

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

**Formic acid:**

Acute oral toxicity : Acute toxicity estimate (Humans): 500 mg/kg  
Method: Expert judgement  
Acute inhalation toxicity : LC50 (Rat): 7.4 mg/l  
Exposure time: 4 h  
Test atmosphere: vapour  
Assessment: Corrosive to the respiratory tract.  
Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Remarks: Based on data from similar materials

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

### 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

### 2,6-Di-tert-butyl-p-cresol:

Acute oral toxicity	:	LD50 (Rat): > 6,000 mg/kg Method: OECD Test Guideline 401
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

### 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

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### **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

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

Species	:	Rabbit
Result	:	Skin irritation

### **Dimethyl octadienol:**

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

### **2,6-Di-tert-butyl-p-cresol:**

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
Remarks	:	Based on data from similar materials

### **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

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Method : OECD Test Guideline 405

### 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.

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

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

### 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

### 2,6-Di-tert-butyl-p-cresol:

Species	: Rabbit
Result	: No eye irritation
Method	: OECD Test Guideline 405
Remarks	: Based on data from similar materials

## Respiratory or skin sensitisation

### Skin sensitisation

Not classified based on available information.

### Respiratory sensitisation

Not classified based on available information.

## Components:

### Starch:

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

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### Ascorbic acid:

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

### Calcium diformate:

Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative
Remarks	: Based on data from similar materials

### Formic acid:

Test Type	: Buehler Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

### 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

### Dimethyl octadienol:

Test Type	: Local lymph node assay (LLNA)
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

### 2,6-Di-tert-butyl-p-cresol:

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

### Germ cell mutagenicity

Not classified based on available information.

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### Components:

#### **Starch:**

Genotoxicity in vitro

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

#### **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

#### **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:**

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**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  
Method: OECD Test Guideline 477  
Result: negative

### **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

### **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

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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

### 2,6-Di-tert-butyl-p-cresol:

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: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)  
Species: Rat  
Application Route: Ingestion  
Result: negative

### 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

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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

### 2,6-Di-tert-butyl-p-cresol:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	22 Months
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 Application Route: Ingestion Result: negative
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#### Ascorbic acid:

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

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

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### 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 foetal 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 foetal development

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

### 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

### Dimethyl octadienol:

Effects on foetal development

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

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### 2,6-Di-tert-butyl-p-cresol:

Effects on fertility	: Test Type: Two-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative
Effects on foetal development	: Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative

### STOT - single exposure

May cause respiratory irritation.

#### Components:

##### Citric acid:

Assessment	: May cause respiratory irritation.
------------	-------------------------------------

### STOT - repeated exposure

Not classified based on available information.

#### Components:

### 2,6-Di-tert-butyl-p-cresol:

Assessment	: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.
------------	--

### 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	: $\geq 4,000$ mg/kg
LOAEL	: $\geq 8,000$ mg/kg
Application Route	: Ingestion
Exposure time	: 10 Days

##### Ascorbic acid:

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

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||| Exposure time : 13 Weeks

### Calcium diformate:

Species	:	Rat
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

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

Species	:	Rat, female
LOAEL	:	335 mg/kg
Application Route	:	Ingestion
Exposure time	:	14 Weeks

### 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

### 2,6-Di-tert-butyl-p-cresol:

Species	:	Rat
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NOAEL	:	25 mg/kg
Application Route	:	Ingestion
Exposure time	:	22 Months

### Aspiration toxicity

Not classified based on available information.

## 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 (Chron-	:	NOEC (Daphnia magna (Water flea)): >= 100 mg/l Exposure time: 21 d

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ic toxicity)

Method: OECD Test Guideline 211

Remarks: Based on data from similar materials

Toxicity to microorganisms

: NOEC:  $\geq 22.1$  mg/l

Exposure time: 28 d

Remarks: Based on data from similar materials

**Phosphoric acid:**

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

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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

### 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

### 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

### 2,6-Di-tert-butyl-p-cresol:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 0.57 mg/l

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		Exposure time: 96 h Method: Directive 67/548/EEC, Annex V, C.1.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.48 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0.24 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
		NOEC (Pseudokirchneriella subcapitata (green algae)): 0.24 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Oryzias latipes (Japanese medaka)): 0.053 mg/l Exposure time: 30 d Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.316 mg/l Exposure time: 21 d
M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50: > 10,000 mg/l Exposure time: 3 h 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 % Exposure time: 5 d Method: OECD Test Guideline 302
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##### **Calcium diformate:**

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 86 %
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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

### 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.

### 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

### 2,6-Di-tert-butyl-p-cresol:

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 4.5 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C

### 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

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

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

### 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

### 2,6-Di-tert-butyl-p-cresol:

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 330 - 1,800

Partition coefficient: n-octanol/water : log Pow: 5.1

### Mobility in soil

No data available

### Hazardous to the ozone layer

Not applicable

### Other adverse effects

No data available

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## 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.

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## 14. TRANSPORT INFORMATION

### International Regulations

#### UNRTDG

UN number : Not applicable  
Proper shipping name : Not applicable  
Class : Not applicable  
Subsidiary risk : Not applicable  
Packing group : Not applicable  
Labels : Not applicable  
Environmentally hazardous : no

#### IATA-DGR

UN/ID No. : Not applicable  
Proper shipping name : Not applicable  
Class : Not applicable

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Subsidiary risk : Not applicable  
Packing group : Not applicable  
Labels : Not applicable  
Packing instruction (cargo aircraft) : Not applicable  
Packing instruction (passenger aircraft) : Not applicable

### IMDG-Code

UN number : Not applicable  
Proper shipping name : Not applicable  
Class : Not applicable  
Subsidiary risk : Not applicable  
Packing group : Not applicable  
Labels : Not applicable  
EmS Code : Not applicable  
Marine pollutant : Not applicable

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

### National Regulations

Refer to section 15 for specific national regulation.

### Special precautions for user

Not applicable

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## 15. REGULATORY INFORMATION

### Related Regulations

#### Fire Service Law

Not applicable to dangerous materials / designated flammables.

#### Chemical Substance Control Law

Priority Assessment Chemical Substance

Chemical name	Number
Formic acid	117
2,6-Di-tert-butyl-4-methylphenol	64

#### Industrial Safety and Health Law

##### Harmful Substances Prohibited from Manufacture

Not applicable

##### Harmful Substances Required Permission for Manufacture

Not applicable

##### Substances Prevented From Impairment of Health

Not applicable

##### Circular concerning Information on Chemicals having Mutagenicity - Annex 2: Information on Existing Chemicals having Mutagenicity

Not applicable

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### **Circular concerning Information on Chemicals having Mutagenicity - Annex 1: Information on Notified Substances having Mutagenicity**

Not applicable

#### **Substances Subject to be Notified Names**

Law Article 57-2 (Ministerial Order Article 34-2 Appended Table 2)

Chemical name	Concentration (%)	Remarks
Phosphoric acid	>=1 - <10	-
3,7-Dimethyl-1,6-octadien-3-ol	>=0.1 - <1	From April 1st, 2025
citral	>=0.1 - <1	From April 1st, 2025

#### **Substances Subject to be Indicated Names**

Law Article 57 (Ministerial Order Article 30 Appended Table 2)

Chemical name	Remarks
Phosphoric acid	-

#### **Skin and Eye Damage Substances (ISHL MO Art. 594-2)**

Chemical name
Phosphoric acid

#### **Carcinogenic Substances (Article 577-2 of the Occupational Health and Safety Regulations)**

Not applicable

#### **Ordinance on Prevention of Hazards Due to Specified Chemical Substances**

Not applicable

#### **Ordinance on Prevention of Lead Poisoning**

Not applicable

#### **Ordinance on Prevention of Tetraalkyl Lead Poisoning**

Not applicable

#### **Ordinance on Prevention of Organic Solvent Poisoning**

Not applicable

#### **Enforcement Order of the Industrial Safety and Health Law - Attached table 1 (Dangerous Substances)**

Not applicable

#### **Poisonous and Deleterious Substances Control Law**

Not applicable

#### **Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof**

Not applicable

#### **High Pressure Gas Safety Act**

Not applicable

#### **Explosive Control Law**

Not applicable

#### **Vessel Safety Law**

Not regulated as a dangerous good

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### Aviation Law

Not regulated as a dangerous good

### Marine Pollution and Sea Disaster Prevention etc Law

Bulk transportation : Not classified as noxious liquid substance

Pack transportation : Not classified as marine pollutant

### Narcotics and Psychotropics Control Act

Narcotic or Psychotropic Raw Material (Export / Import Permission)

Not applicable

Specific Narcotic or Psychotropic Raw Material (Export / Import permission)

Not applicable

### Waste Disposal and Public Cleansing Law

Industrial waste

### 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

In this SDS, if the concentration of substances subject to notification under the Industrial Safety and Health Law is indicated as a range, it includes cases where it is a trade secret.

### 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/>

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

Date format : yyyy/mm/dd

### Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

JP ISHL OEL 577-2(2) : Concentration standard (Value set by the Minister of Health, Labour and Welfare stipulated under the Ministerial Ordinance Article 577-2(2))

JP OEL JSOH : Japan. The Japan Society for Occupational Health. Recommendation of Occupational Exposure Limits

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

ACGIH / STEL : Short-term exposure limit

JP ISHL OEL 577-2(2) / 8h-OEL-M : 8-hour Occupational Exposure Limit-Mean

JP OEL JSOH / OEL-M : Occupational Exposure Limit-Mean

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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 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; 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.

JP / EN