

Safety Data Sheet  
R-1 : Chromogenic Substrate (TMB)

Established in April 2020. ver.1.0

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1. Product and Company Information

Product Name	COVID-19 Human IgM IgG ELISA kit (Nucleocapsid Protein)
Relevant Component	R-1 : Chromogenic Substrate (TMB)
Company	Cellspect Co., Ltd.
Address	2-4-23 Kitaiioka, Morioka, Iwate, Japan
Department in Charge	R&D Department
Telephone No.	019-681-6710
Product Code	ERCOEL961-N
Emergency Contact	Cellspect Co., Ltd.
Telephone No.	019-681-6710

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2. Hazard Identification

GHS Classification

Health Hazards	Serious eye damage, eye irritation	Category 2A
	Reproductive toxicity (fertility)	Category 1B
	Reproductive toxicity (fetus development)	Category 1B
	Specific target organ toxicity (repeated exposure)	Category 2
	Specific target organ toxicity (kidney, liver)	Category 2

Environmental Hazards	Acute aquatic toxicity	Category 3
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GHS Label Elements

Symbols / Pictograms :



Signal Word : Danger

Hazardous Information : Causes serious eye irritation.  
Suspected of damaging fertility or the unborn child.  
Causes damage to organs through prolonged or repeated exposure. (kidney, liver)

Instructions :

**[Precaution]**  
Obtain the instruction manual before use.  
Do not handle until all safety precautions have been read and understood.  
Wear protective gloves, safety goggles or face shield, and protective clothing.  
Avoid release to the environment.  
Do not breathe vapors.  
Wash hands thoroughly after handling.

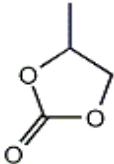
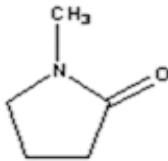
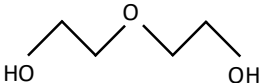
**[First-aid measures]**  
Get medical attention if you feel unwell.  
Get medical attention if exposed or concerned.  
Irrigate carefully for several minutes with water. Next, if wearing contact lenses that can be removed easily, remove the contact lenses. Thereafter, continue to wash.  
Get medical attention if eye irritation persists.

【Storage】  
Store locked up.

【Disposal】  
Dispose of contents and containers in accordance with local, regional, national and international regulations.

### 3. Composition / Information on Ingredients

Substance/Mixture : Mixture

Ingredient Name	Formula	Chemical Properties (formula or structural)	%	CAS	MITI number
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	C <sub>4</sub> H <sub>6</sub> O <sub>3</sub> (102.09)		≥10 – ≤25	108-32-7	(5)-524 (J-CHECK) (5)-524 (JISHA)
1-Methyl-2-pyrrolidone	C <sub>5</sub> H <sub>9</sub> NO (99.13)		<10	872-50-4	(5)-1138 (J-CHECK) (8)-1-1013 (JISHA) (8)-1-1014 (JISHA)
Diethylene glycol	C <sub>4</sub> H <sub>10</sub> O <sub>3</sub> (106.12)		≤3.0	111-46-6	(2)-415 (J-CHECK) (2)-415 (JISHA)
Hydrogen peroxide	H <sub>2</sub> O <sub>2</sub> (34.014)	HO-OH	<1.0	7722-84-1	(1)-419 (J-CHECK)

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section. If there are exposure limits, they are listed in section 8.

### 4. First Aid Measures

Inhalation :  
If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.  
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.  
Get medical attention.  
If unconscious, place in recovery position and get medical attention immediately.  
Maintain an open airway.  
Loosen tight clothing such as a collar, tie, belt or waistband.  
In case of inhalation of decomposition products in a fire, symptoms may be delayed.  
The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact :  
Flush contaminated skin with plenty of water.  
Remove contaminated clothing and shoes.  
Wash contaminated clothing thoroughly with water before removing it, or wear gloves.  
Continue to rinse for at least 10 minutes.  
Get medical attention.  
Wash clothing before reuse.

Clean shoes thoroughly before reuse.

Eye contact : Immediately flush eyes with plenty of water and occasionally lifting the upper and lower eyelids.  
Check for and remove any contact lenses.  
Continue to rinse for at least 10 minutes.  
Get medical attention.

Ingestion : Wash out mouth with water.  
Remove dentures if any.  
Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
If material has been swallowed and the exposed person is conscious, give small quantities of water to drink.  
Stop the above water supply if the exposed person feels sick as vomiting may be dangerous.  
Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.  
Get medical attention  
Never give anything by mouth to an unconscious person.  
If unconscious, place in recovery position and get medical attention immediately.  
Maintain an open airway.  
Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms / effects (acute and delayed) :

【Potential acute health effects】

Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Eye contact : Serious eye irritation  
Ingestion : No known significant effects or critical hazards.

【Over-exposure signs/symptoms】

Inhalation : Birthweight is reduced, stillborn births increase, external malformation of skeleton  
Skin contact : Birthweight is reduced, stillborn births increase, external malformation of skeleton  
Eye contact : Pain, irritation, tearing, and redness  
Ingestion : Birthweight is reduced, stillborn births increase, external malformation of skeleton

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed.  
The exposed person may need to be kept under medical surveillance for 48 hours.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.  
If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.  
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.  
Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

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## 5. Fire Fighting Measures

Extinguishing media : Use extinguishing media suitable for surrounding fire.

Unsuitable Extinguishing Media :  
None known.

Special hazards arising from the substance or mixture :

In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Toxic to aquatic life.

Contain contaminated runoff from fire control and prevent entry to waterways, drains and sewers.

Hazardous thermal decomposition: Decomposition products may include the following materials:

Carbon dioxide, carbon monoxide, nitrogen oxides

Special protective equipment for firefighters :

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

No action shall be taken involving any personal risk or without suitable training.

Advice for firefighters :

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus with a full face-piece operated in positive pressure mode.

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## 6 . Accidental Release Measures

Personal precautions, protective equipment and emergency procedures :

【For non-emergency personnel】

No action shall be taken involving any personal risk or without suitable training.

Evacuate surrounding areas.

Keep unnecessary and unprotected personnel from entering.

Do not touch or walk through spilt material.

Avoid exposure to mists or gases.

Ensure adequate ventilation.

Wear appropriate respirator when ventilation is inadequate.

Wear recommended personal protective equipment.

【For emergency responders】

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-

Environmental precautions :

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Containing water pollutant

May be hazardous to the environment if large quantities have been released.

Methods and material for containment and cleaning up :

Stop leak if without risk.

Move containers from spill area.

Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container.

Dispose of waste via a licensed waste disposal contractor.

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## 7 . Handling and Storage

Precautions for safe handling :

【Protective measures】

Put on appropriate personal protective equipment (see Section 8).

Avoid exposure.

Obtain the instruction manual before use.

Avoid exposure during pregnancy. Do not handle until all safety precautions have been

read and understood.

Do not get in eyes or on skin or clothing.

Do not breathe vapour or mist.

Do not ingest.

Avoid release to the environment.

If there is a risk of respiratory hazard during normal handling of this material, carry out operations under ventilation or with respiratory protection.

Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**[Advice on general occupational hygiene]**

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.

Workers should wash hands and face before eating, drinking and smoking.

Remove contaminated clothing and protective equipment before entering eating areas.

See also Section 8 for additional information on hygiene measures.

**[Conditions for safe storage, including any incompatibilities]**

Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F).

Store in accordance with local regulations.

Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink.

Store locked up.

Keep container tightly closed and sealed until ready for use.

Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

Do not store in unlabelled containers.

Use appropriate containment to avoid environmental contamination.

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## 8. Exposure Controls / Personal protection

### Occupational exposure limits

Ingredient Name	Exposure limits (Japan Society for Occupational Health, 2005 edition)
1-Methyl-2-pyrrolidone	Absorbed through skin. OEL-M : 1 ppm 8 hr (s) OEL-M : 4 mg/m <sup>3</sup> 8 hr (s)

### Appropriate engineering controls :

Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any

### Environmental exposure controls :

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Personal protection :

**[Hygiene measures]**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Appropriate techniques should be used to remove potentially contaminated clothing.

Wash contaminated clothing before reusing.

Ensure that eyewash stations and safety showers are close to the workstation location.

**[Eye/face protection]**

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection :

**[Hand protection]**

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is Confirm the parameters specified by the glove manufacturer to ensure that the glove still retains its protection during use.

Please note that breakthrough time of gloves varies due to different manufacturers and materials.

In the case of handling mixture of several substances, the protective time of gloves cannot be accurately estimated.

**[Body protection]**

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling

**[Other skin protection ]**

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a

Respiratory protection :

Use a respirator complying with an approved standard if a risk assessment indicates this is necessary.

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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9 . Physical / Chemical Properties

Physical State :	Liquid
Colour :	No data available
Odour :	Odourless
Odour Threshold :	No data available
pH :	5.1
Melting / Freezing point :	No data available
Boling Point / Initial Boiling Point / Boiling Range :	No data available
Flash point :	No data available
Fire point :	No data available
Evaporation rate :	No data available
Flammability :	Non-flammable
Explosive limits :	No data available
Vapour pressure :	No data available
Vapour density (air=1) :	No data available
Density :	No data available
Solubility :	Soluble in cold or warm water
Octanol / Water partition coefficient :	No data available
Self ignition temperature :	No data available
Decomposition temperature :	No data available
Viscosity :	No data available

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1 0 . Stability and Reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Stability : Stable

Possibility of hazardous reactions :

No hazardous reactions reported under conditions of normal storage and use

Conditions to avoid : No data available

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products :

No dangerous decomposition products known under conditions of normal storage and use

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## 1 1. Toxicological Information

### Acute toxicity

Product / Ingredient	Result	Species	Dose	Exposure
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	LD <sub>50</sub> Oral	Rat	> 5000mg/kg	—
1-Methyl-2-pyrrolidone	LD <sub>50</sub> Dermal	Rabbit	8g/kg	—
	LD <sub>50</sub> Oral	Rat	3914mg/kg	—
Diethylene glycol	LD <sub>50</sub> Dermal	Rabbit	11890mg/kg	—
	LD <sub>50</sub> Oral	Rat	12000mg/kg	—
Hydrogen peroxide	LD <sub>50</sub> Oral	Rat	693.7mg/kg (70% solution)	—

### Corrosive / Irritation

Product / Ingredient	Result	Species	Score	Exposure
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	Eyes : Moderate irritant	Rabbit	—	60mg
	Skin : Moderate irritant	Rabbit	—	500mg
1-Methyl-2-pyrrolidone	Eyes : Moderate irritant	Rabbit	—	100mg
	Skin : Mild irritant	Rabbit	—	
Diethylene glycol	Eyes : Mild irritant	Rabbit	—	50mg
	Skin : Mild irritant	Rabbit	—	500mg
Hydrogen peroxide	Eyes : Severe irritant	Rabbit	—	1mg

Conclusion / Summary : Repeated exposure may cause skin dryness or cracking.

Sensitization : No data available

Mutagenicity : No data available

Carcinogenicity : No data available

Reproductive toxicity : No data available

Teratogenicity : No data available

Specific target organ toxicity (single exposure)

Product / Ingredient	Category	Route of exposure	Target organ
1-Methyl-2-pyrrolidone	Category 3	Not applicable	Anesthetic action
Hydrogen peroxide	Category 1	No specific data	Respiratory system

Specific target organ toxicity (repeated exposure)

Product / Ingredient	Category	Route of exposure	Target organ
1-Methyl-2-pyrrolidone	Category 2	No specific data	Bone marrow, liver, lung
Diethylene glycol	Category 1	No specific data	Kidney, Liver
Hydrogen peroxide	Category 1	No specific data	Respiratory system

Aspiration Hazard : No data available

Likely routes of exposure :  
Oral, dermal, inhalation

Potential acute health effects :  
[Eye contact]  
Serious eye irritation

[Inhalation]  
No known significant effects or critical hazards.  
[Skin contact]  
No known significant effects or critical hazards.

[Ingestion]  
No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics :

[Eye contact]  
Pain, irritation, tearing, and redness

[Inhalation]  
Birthweight is reduced, stillborn births increase, external malformation of skeleton

[Skin contact]  
Birthweight is reduced, stillborn births increase, external malformation of skeleton

[Ingestion]  
Birthweight is reduced, stillborn births increase, external malformation of skeleton

Delayed and immediate effects as well as chronic effects from short and long-term exposure :

[Short term exposure]  
Potential immediate effect No data available  
Potential delayed effects : No data available

[Long term exposure]  
Potential immediate effect No data available  
Potential delayed effects : No data available

Potential chronic health effects :  
No data available

[General ]  
May cause damage to organs through prolonged or repeated exposure.



**[Carcinogenicity]**

No known significant effects or critical hazards.

**[Mutagenicity]**

No known significant effects or critical hazards.

**[Teratogenicity]**

May cause damage to fetus.

**[Developmental effects]**

No known significant effects or critical hazards.

**[Reproductive effects]**

May cause damage to reproductive ability

Numerical measures of toxicity (acute toxicity estimates)

Route	Acute toxicity estimates (ATE value)
Oral	41200mg/kg

1 2. Ecological Information

Toxicity

Product / Ingredient	Result	Species	Exposure
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	Acute EC <sub>50</sub> > 900mg/l	Algae	72 hr(s)
	Acute EC <sub>50</sub> > 1000mg/l fresh water	Daphnia	48 hr(s)
	Acute EC <sub>50</sub> > 1000mg/l	Fish	96 hr(s)
	Acute NOEC 929mg/l fresh water	Daphnia	72 hr(s)
	Acute NOEC 1000mg/l fresh water	Fish	96 hr(s)
1-Methyl-2-pyrrolidone	Acute LC <sub>50</sub> 1.23~1.5ppm fresh water	Daphnia Daphnia magna	48 hr(s)
1-Methyl-3-pyrrolidone	Acute LC <sub>50</sub> 832ppm fresh water	Fish Lepomis macrochirus	96 hr(s)
Diethylene glycol	Acute LC <sub>50</sub> 75200000 µg/l fresh water	Fish Pimephales promelas	96 hr(s)
Hydrogen peroxide	Acute EC <sub>50</sub> 1.2mg/l marine water	Algae Dunaliella tertiolecta exponential growth phase	72 hr(s)
	Acute EC <sub>50</sub> 5.38mg/l fresh water	Algae - Pseudokirchneriella subcapitata	96 hr(s)
	Acute EC <sub>50</sub> 2320 µg/l fresh water	Daphnia Daphnia magna Newborn	48 hr(s)
	Acute LC <sub>50</sub> 993ppm fresh water	Fish Oncorhynchus	96 hr(s)
	Chronic NOEC 989.7ppm fresh water	Fish Oncorhynchus tshawytscha Egg	43 day(s)

Persistence and degradability

Product / Ingredient	Test	Result	Dose	Inoculum
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	—	97%-14 day(s)	—	13.69mg/l Activated
	EU	97%-14 day(s)	—	—
1-Methyl-2-pyrrolidone	302B Inherent Biodegradability: Zahn-Wellens/ EMPA Test	>90%-8 day(s)	—	—
Diethylene glycol	301A Ready Biodegradability DOC Die-Away Test	91.8%-28 day(s)	—	—

Product / Ingredient	Half-life (in water)	Photodegradation	Biodegradation
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	—	—	Easy
1-Methyl-2-pyrrolidone	—	—	Easy
Diethylene glycol	—	—	Easy

Bioaccumulative potential

Product / Ingredient	LogP <sub>ow</sub>	BCF	Potential
2-Oxo-4-methyl-1, 3-dioxolan (propylene carbonate)	-0.41	—	Low
1-Methyl-2-pyrrolidone	-0.46	—	Low
Diethylene glycol	-1.98	100	Low
Hydrogen peroxide	-1.36	—	Low

Mobility in soil : No data available

Results of PBT and vPvB assessment : Not applicable

Other adverse effects : No known significant effects or critical hazards.

1 3. Disposal Considerations

Waste treatment methods :

The generation of waste should be avoided or minimised wherever possible.  
 Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional  
 Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.  
 Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.  
 Waste packaging should be recycled.  
 Incineration or landfill should only be considered when recycling is not feasible.  
 This material and its container must be disposed of in a safe way.  
 Handle empty containers that have not been cleaned or washed with much care.  
 Empty containers or liners may retain some product residues.  
 Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

1 4. Transport Information

Applicable Law : [UN/IMDG/IATA]  
 Not regulated

Special precautions for user

【Transport within user's premises】

Always transport in closed containers that are upright and secure.

Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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1 5 . Regulatory Information

Fire Services Act (Japan)

Category	Item	Classification	Signal word	Specified quantity
Category IV	Class III petroleum	III	Flammables	2000L 4000L
	Class III petroleum(water-soluble)	III	Flammables	4000L
Category VI	Hydrogen peroxide	No data	No data	No data

Fire Services Act interfering substance :

Not applicable

Designated combustible : No specific data

Specified quantity : No specific data

Maritime Traffic Safety Act (Japan) :

Not applicable

Industrial Safety and Health Act (Japan) :

【Chemical substances for specific use】

Not applicable

【Labeling regulations】

Product / Ingredient	Situation	Code
1-Methyl-2-pyrrolidone	Applicable	588-2

【Hazardous or harmful substances which should be notified】

Product / Ingredient	Situation	Code
1-Methyl-2-pyrrolidone	Applicable	588-2
Hydrogen peroxide	Applicable	126

【Carcinogen】

Not applicable

【Mutagenic substance】

Not applicable

Corrosive liquid : Not applicable

Lead poisoning prevention policy :

Not applicable

Prevention of allergic lead poisoning :

Not applicable

Hazardous substances that should be licensed for production :

Not applicable

Hazardous substances : Not applicable

Ordinance on the Prevention of Organic Solvent Poisoning (Japan) :

Not applicable

Japanese Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. :

Product / Ingredient	Situation	Code
1-Methyl-2-pyrrolidone	Priority Assessment Chemical Substance	134
Hydrogen peroxide	Priority Assessment Chemical Substance	89

Japanese Poisonous and Deleterious Substances Control Law : Not applicable

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#### 1 6 . Other Information

##### Disclaimer

The information above represents the best information currently available to us and is given in good faith but without warranty. Users should make their own investigations to make sure that the information is appropriate and complete for his special use of this product. This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process.

※ Quoresearch / Quontest is the name of the reagent kit of Cellspect Co., Ltd.

Safety Data Sheet  
R-2 : Stop reagent (1 mol/L hydrochloric acid)

Established in April 2020. ver.1.0

1. Product and Company Information

Product Name	COVID-19 Human IgM IgG ELISA kit (Nucleocapsid Protein)
Relevant Component	R-2 : Stop reagent (1 mol/L hydrochloric acid)
Company	Cellspect Co., Ltd.
Address	2-4-23 Kitaiioka, Morioka, Iwate, Japan
Department in Charge	R&D Department
Telephone No.	019-681-6710
Product Code	ERCOEL961-N
Emergency Contact	Cellspect Co., Ltd.
Telephone No.	019-681-6710

2. Hazard Identification

GHS Classification

Physical hazards	Explosives	Not applicable
	Flammable gases	Not applicable
	Flammable aerosols	Not applicable
	Oxidizing gases	Not applicable
	Gases under pressure	Not applicable
	Flammable liquids	Not classified
	Flammable solids	Not applicable
	Self-reactive substance and mixture	Not applicable
	Pyrophoric liquid	Not classified
	Pyrophoric solid	Not applicable
	Self-heating substance and mixture	Not classified
	Substance which, in contact with water, emits flammable gases	Not applicable
	Oxidizing liquid	Not classified
	Oxidizing solid	Not applicable
Organic peroxide	Not applicable	
Corrosive to metal	Not classified	
Health Hazards	Acute toxicity (oral)	Category 4
	Acute toxicity (dermal)	Not classified
	Acute toxicity (inhalation: gases)	Not applicable
	Acute toxicity (inhalation: vapours)	Not applicable
	Acute toxicity (inhalation: dust)	Not applicable
	Acute toxicity (inhalation: mist)	Category 2
	Skin corrosion/ irritation	Category 2
	Serious eye damage / eye irritation	Category 1
	Respiratory sensitisation	Category 1
	Skin sensitisation	Not classified
	Germ cell mutagenicity	Not classified
	Carcinogenicity	Not classified
	Reproductive toxicity	Not classified
Specific target organ systemic toxicity - single exposure	Category 2 (Respiratory system)	
Specific target organ systemic toxicity - repeated exposure	Category 2 (Teeth, respiratory system)	
Aspiration hazard	Not classified	
Environmental hazards	Acute aquatic hazard	Category 2

## GHS Label Elements

Symbols / Pictograms :



Signal Word :

Danger

Hazardous Information :

Harmful if inhaled (gas, vapour, dust and mist)  
 Skin irritation  
 Serious eye damage  
 May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
 May causes damage to organs.  
 May cause damage to organs through prolonged or repeated exposure.  
 Toxic to aquatic life

Instructions :

**【Precaution】**  
 Wear suitable respiratory protective equipments.  
 Wear suitable protective gloves,  
 safety goggles or face shield, and protective clothing.  
 Do not breathe dust, smoke, gas, mist, vapour or spray.  
 Do not breathe mist If user operations generate particles that can be inhaled.  
 Use the product only in a well ventilated room or outdoors.  
 Wash hands thoroughly after handling this material.  
 Eating, drinking and smoking should be prohibited when handling this material.  
 Avoid release to the environment.

**【First-aid measures】**  
 If swallowed, rinse mouth with water and do not induce vomiting.  
 If contact with skin, wash contaminated clothing thoroughly with water  
 before removing it, or wear gloves.  
 Wash contaminated clothing before reuse.  
 If inhaled, remove victim to fresh air and keep at rest in a position comfortable  
 for breathing.  
 If contact with eyes, rinse cautiously with water for several minutes.  
 Remove contact lenses, if present and easy to do. Continue rinsing.  
 In case of skin contact, eye contact, ingestion and inhalation,  
 get immediate medical advice.  
 Get medical attention if you feel unwell.

**【Storage】**  
 Store locked up.  
 Keep container tightly closed and in a well-ventilated place.

**【Disposal】**  
 Dispose of contents and containers in accordance with local, regional,  
 national and international regulations.

## 3. Composition / Information on Ingredients

Substance/Mixture : Mixture

Chemical name / common name	Formula	Chemical Properties (formula or structural)	%	CAS	MITI number
Hydrogen chloride	HCl	-	<3.6	7647-01-0	1-215

#### 4. First Aid Measures

Inhalation :	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, get medical advice/attention. Get medical attention if you feel unwell.
Skin contact :	Remove immediately all contaminated clothing. Rinse skin with water / shower. Flush contaminated skin with plenty of water. If skin irritation or rash occurs, get medical advice / attention.
Eye contact :	Get medical attention. Irrigate carefully for several minutes with water. Next, if wearing contact lenses that can be removed easily, remove the contact lenses. Thereafter, continue to wash. Get medical attention if eye irritation persists.
Ingestion :	Wash out mouth with water. Do not induce vomiting. Get medical attention if you feel unwell.

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#### 5. Fire Fighting Measures

The product itself does not burn.  
Use extinguishing media suitable for surrounding fire.

Special hazards arising from the substance or mixture :

If heated, the container may burst, with the risk of a subsequent explosion.  
Fire will produce irritating, corrosive and/or toxic gases.

Specific extinguishing methods :

Move the container from the region on fire if there is no danger.  
Cool down the containers with a plenty of water properly even after extinguishment.  
Transfer movable containers promptly to safe places.

Advice for firefighters :

Use appropriate breathing equipment and wear chemical protection clothes.

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#### 6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures :

Use appropriate protective equipment to avoid contact to eyes and skin, and inhalation of gas.  
(see section 8. "Exposure Controls / Personnel Protection")  
Segregate the affected area as released area with proper distance to all direction.  
Prohibit to enter the area except concerned persons.  
Use appropriate protective equipment to avoid contact to eyes and skin, and inhalation of gas. (see section 8)  
Do not touch damaged containers or spilled chemicals without personnel protective equipment.  
Stay upwind.  
Keep out of low areas.

Environmental hazard precaution :

Prevent flow out to river, etc. so as not to badly affect the environment.  
Avoid release to the environment.

Recovery and neutralization :

For small scale leakage, use absorbent (sawdust, dirt, sand, waste rug) to remove most of the spill and wipe off the rest using waste rug.

Methods and material for containment and cleaning up :

Stop leak if without risk.

Prevention of secondary casualty :

Collect spills.

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## 7. Handling and Storage

Handling :

**[Technical measures]**

Put on appropriate personal protective equipment. (see Section 8)

**[Local & total ventilation]**

Implement local ventilation and total ventilation as described in section 8.

**[Safe handling]**

Keep the concentration in the air below the exposure limit by adequate ventilation.

Avoid contact, ingestion and inhalation.

Wash hands thoroughly after handling this material.

Use the product only in a well ventilated room or outdoors.

Eating, drinking and smoking should be prohibited when handling this material.

Avoid release to the environment.

**[Contact evasion]**

See section 10 "Stability and Reactivity".

Storage :

**[Technical measures]**

The storage area should be equipped with the necessary lighting and ventilation facilities and without dangerous substances.

No special technical measures required.

**[Incompatible materials]**

See section 10 "Stability and Reactivity".

**[Storage conditions]**

Store away from oxidizing agents.

No special technical measures required.

Keep container tightly closed and store in a well-ventilated place.

Store locked up.

**[Container and packing materials]**

Use the containers specified in the UN transportation law.

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## 8. Exposure Controls / Personal protection

Control concentration : Not set.

Permissible concentration (exposure limits, biological exposure indices)

Japan Society for Occupational Health (2014 edition)	2ppm; 3.0 mg/m <sup>3</sup> maximum allowable dose levels
ACGIH (2000 edition)	STEL; upper limit 2ppm (possible stimulus to respiratory tract)

Appropriate engineering controls :

Ensure that eyewash stations and safety showers are close to the workstation location.

Keep the process closed, equip with local exhaust ventilation , or take other engineering measures to control airborne contamination level



below permissible concentration.

When mist is generated in the heating process,  
install a ventilation device to keep the air pollutants below the control.  
When gas is generated in the heating process,  
install a ventilation device to keep the air pollutants below the control

Personal protection :

**【Respiratory protection】**

Wear suitable respiratory protective equipments .  
Wear a mask or respirator when there is potential for exposure.

**【Hand protection】**

Wear appropriate protective gloves.  
Nitrile rubber and PVC are not suitable protective materials.  
Neoprene is recommended.  
If there is a risk of splashing, wear full-body chemical protective clothing  
(acid resistant suit, etc.).

**【Eye protection】**

Wear suitable safety goggles.  
Wear appropriate chemical splash goggles or face shield.  
Wear suitable protective gloves, safety goggles or face shield,  
and protective clothing.

**【Skin and body protection】**

Wear suitable protective clothing and face shield.  
Wear suitable protective face shield.  
To prevent any contact, wear neoprene gloves, an apron, boots,  
or an impermeable protective suit such as an overall suit.  
If there is a risk of splashing, wear full-body chemical protective clothing  
(acid resistant suit, etc.) and boots.

**【Hygiene measures】**

Wash hands thoroughly after handling this material.

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## 9. Physical / Chemical Properties

Physical State :	Colourless liquid
Odour :	Odourless
pH :	No data available
Melting / Freezing point :	No data available
Boiling Point / Initial Boiling	No data available
Flash point :	No data available
Explosion range :	No data available
Vapour pressure :	No data available
Vapour density (air=1) :	No data available
Density :	1.02 g/cm <sup>3</sup>
Solubility :	Soluble
Octanol / Water partition coefficient :	No data available
Self ignition temperature :	No data available
Decomposition temperature :	No data available
Odour Threshold :	No data available
Evaporation rate :	No data available
Flammability (solid, gas) :	Not applicable
Viscosity :	No data available

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## 10. Stability and Reactivity

Stability : No data available

Possibility of hazardous reactions :

The aqueous solution is a strong acid.

Reacts violently with bases and corrosive.  
Reacts violently with oxidizing agents.  
Generate toxic gas (chlorine).  
Corrosive to metals in the presence of water.  
Generate flammable and explosive gas. (hydrogen)

Conditions to avoid : Incompatible materials.  
Fire.

Incompatible materials : Base, oxidizing agents, metal

Hazardous decomposition products :  
Chlorine, hydrogen

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## 11. Toxicological Information

Acute toxicity : Oral : Rat, LD50 : 238mg/kg (SIDS, 2009)  
Inhalation : Rat, LC50 : 1411ppm/4hr (SIDS, 2009)  
Labor Standards Act : Disease chemicals, hydrogen chloride

Local effects : Skin Corrosion / Irritation : Corrosive to Rabbit / Mouse / Rat / Human.  
(SIDS, 2009)[data released in Japan]  
Serious eye damage / irritation : Corrosive to Rabbit.  
(SIDS, 2002)[data released in Japan]

Since the pH of concentrated sulfuric acid is 1 or less,  
it was determined to be a corrosive substance according to  
the GHS classification, and it was classified as category 1A-1C.  
Here it is classified as category 1A.  
Cause severe skin burns and eye damage.

It was observed that serious eye damage occurred  
by dissolution of the anterior chamber in human in an accident. 7)  
It was classified into category 1 from the description 6)  
that 5% liquid was moderately irritating, and 10% liquid was a strongly  
irritating to rabbit eyes, and since the pH of this substance is 2 or less,  
it was classified into category 1.  
Cause serious eye damage.

Respiratory sensitization : cat. 1; Japanese Society of Occupational and Environmental Allergy  
[Data released in Japan]

Skin sensitization : No data available

Germ cell mutagenicity : No data available

Carcinogenicity : IARC-Gr.3 : Carcinogenicity to humans cannot be classified.  
ACGIH-A4(2000) : Carcinogenicity to humans cannot be classified

Reproductive toxicity : No data available

Specific target organ toxicity (single exposure) :  
[Category 1] Respiratory system (ACGIH, 2003)

Specific target organ toxicity (repeated exposure) :  
[Category 1] Teeth, Respiratory system (SIDS, 2002)

Aspiration hazard : No data available

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## 12. Ecological Information

- Acute aquatic hazard : Crustacean (*Daphnia magna*) EC50=0.492mg/L/48hr (SIDS, 2005)  
Toxic to aquatic life.
- Chronic aquatic hazard : Toxicity is generated due to the formation of strong acid  
in the aqueous solution. However, it is not classified in aquatic environment  
because the toxicity is mitigated by buffering.

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## 13. Disposal Considerations

- Residual waste : Prior to disposal, treatments such as detoxification, stabilization and  
neutralization are carried out to the extent possible to reduce the hazard level.  
Since it is strong acid, neutralize it with an alkali and then dispose.  
Dispose of in accordance with relevant laws and local government standards.  
Outsource to an industrial waste disposal contractor licensed by the prefectural  
governor, or to a local public entity.  
If outsourcing waste disposal, thoroughly notify the disposal contractor  
of the dangers and harmfulness before outsourcing.

### Contaminated containers and packaging :

Containers should be cleaned and recycled or disposed of properly  
in accordance with relevant laws and local government standards.  
When disposing of empty containers, completely remove the contents.  
Dispose of spray cans in accordance with relevant laws and local government  
standards.

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## 14. Transport Information

### International Regulations

#### Marine transportation information :

- Follow IMO regulations.
- UN No. 1050  
Proper Shipping Name. HYDROGEN CHLORIDE, ANHYDROUS  
Class 2.3  
Sub Risk 8  
Marine Pollutant Not Applicable

#### Aviation transportation information :

- Follow ICAO / IATA regulations.
- UN No. 1050  
Proper Shipping Name. Hydrogen chloride, anhydrous  
Loading information Forbidden

### Domestic regulations (Japan)

#### Rail and road transportation information :

Follow the regulations of High Pressure Gas Safety Law  
and Poisonous and Deleterious Substances Control Law.

#### Marine transportation information :

- Follow the regulations of Ship Safety Act.
- UN No. 1050  
Proper Shipping Name. Hydrogen chloride (anhydrous)  
Class 2.3  
Subsidiary hazard 8  
Marine pollutants Not applicable

#### Aviation transportation information :

- Follow the regulations of Civil Aeronautics Act.
- UN No. 1050  
Proper Shipping Name. Hydrogen chloride (anhydrous)  
Loading information Forbidden

### Specific precautionary transport measures and conditions

When transporting, avoid direct sunlight, and ensure that containers are loaded  
without breakage, corrosion or leakage to prevent collapse of cargo.

Do not transport with food or feed.  
Do not load heavy items.  
It is necessary to keep the yellow card when transferring.  
Do not stack on top of other dangerous or flammable materials.  
Do not load near other dangerous materials.

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#### 1 5. Regulatory Information

Fire Services Act (Japan) : Not applicable

Poisonous and Deleterious Substances Control Act (Japan) : Not applicable

Industrial Safety and Health Act (Japan) :

Hazardous or harmful substances which should be displayed  
(Article 57, Article 18 Schedule 9 of Order)

Hazardous or harmful substances which should be notified  
(Article 57-2, Article 18 Schedule 9 of Order)

Hazardous substances that should undergo risk assessment  
(Article 57-3)

Specified Chemical Substances Class 3

(Article 2-1-6,

Ordinance on Prevention of Hazards Due to Specified Chemical Substances)

Ship Safety Act (Japan) :

High pressure gas

(Appendix 1, Article 3 of Regulations for the Carriage  
and Storage of Dangerous Goods in Ship)

Civil Aeronautics Act (Japan) :

Prohibited from Being Transported (Article 194 of Ordinance for Enforcement)

Air Pollution Control Act (Japan) :

Specific substance (Article 17-1, Article 10 of Order)

Act on Prevention of Marine Pollution and Maritime Disaster (Japan) :

Hazardous liquid substance

(Z type substance) (Enforcement Order Appendix Table 1)

Water Pollution Prevention Act (Japan) :

Specified substance (Article 2-4, Article 3-3 of Order)

Export Trade Control Order (Japan) : Not applicable

PRTR Law (Japan) : Not applicable

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#### 1 6. Other Information

References Globally Harmonized System of classification and labelling of chemicals, (6th ed., 2015), UN Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN IMDG Code, 2018 Edition (Incorporating Amendment 39-18)  
IATA Dangerous Goods Regulations 60th edition (2019)  
Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)  
2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)  
2019 TLVs and BEIs. (ACGIH)  
<http://monographs.iarc.fr/ENG/Classification/index.php>  
JIS Z 7253 : 2019  
JIS Z 7252 : 2019  
2018 Recommendation of allowable concentration (Japan Society for Occupational Health)  
Supplier's data/information

#### Disclaimer

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