

Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Formaldehyde solution

Reference number(SDS): 69360jis_J_E1-3

Product type:

Reagent

Details of the supplier of the safety data sheet

Manufacturer/Supplier: JUNSEI CHEMICAL CO., LTD.

Address: 1-6, Ohmano-cho, Koshigaya-shi, Saitama 343-0844, Japan

Division: Quality Assurance Department

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e-mail address: shiyaku-t@junsei.co.jp

Section 2. Hazards identification

GHS classification and label elements of the product**Classification of the substance or mixture****PHYSICAL AND CHEMICAL HAZARDS**

Flammable liquids: Category 4

HEALTH HAZARDS

Acute toxicity (Oral): Category 4

Acute toxicity (Dermal): Category 3

Acute toxicity (Inhalation): Category 2

Skin corrosion/irritation: Category 1

Serious eye damage/eye irritation: Category 2

Respiratory sensitization: Category 1

Skin sensitization: Category 1

Germ cell mutagenicity: Category 2

Carcinogenicity: Category 1A

Reproductive toxicity: Category 1B

Specific target organ toxicity – single exposure: Category 1 (nervous system, respiratory system)

Specific target organ toxicity – single exposure: Category 2 (central nervous system, visual organs, systemic)

Specific target organ toxicity – repeated exposure: Category 1 (respiratory system, central nervous system)

Specific target organ toxicity – repeated exposure: Category 2 (central nervous system, visual organs)

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment, short-term (acute): Category 2

Hazardous to the aquatic environment, long-term (chronic): Category 3

(Note) GHS classification without description: Not classified/Classification not possible

Label elements

Signal word: Danger

HAZARD STATEMENT

H227-Combustible liquid

H302-Harmful if swallowed

H311-Toxic in contact with skin

H330–Fatal if inhaled

H314–Causes severe skin burns and eye damage

H334–May cause allergy or asthma symptoms or breathing difficulties if inhaled

H317–May cause an allergic skin reaction

H341–Suspected of causing genetic defects

H350–May cause cancer

H360–May damage fertility or the unborn child

H370–Causes damage to organs

H371–May cause damage to organs

H372–Causes damage to organs through prolonged or repeated exposure

H373–May cause damage to organs through prolonged or repeated exposure

H401–Toxic to aquatic life

H412–Harmful to aquatic life with long lasting effects

PRECAUTIONARY STATEMENT

Prevention

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Avoid release to the environment.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Do not breathe dust/fume/gas/mist/vapors/spray.

In case of inadequate ventilation wear respiratory protection.

Use only outdoors or in a well-ventilated area.

Wash contaminated parts thoroughly after handling.

Contaminated work clothing should not be allowed out of the workplace.

Wear protective gloves/protective clothing/eye protection/face protection.

Use personal protective equipment as required.

Do not eat, drink or smoke when using this product.

Response

In case of fire: Use water mist, foam, dry powder, CO2 to extinguish.

Get medical advice/attention if you feel unwell.

IF exposed or concerned: Get medical advice/attention.

Immediately call a POISON CENTER/doctor/physician.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF exposed or concerned: Call a POISON CENTER/doctor/physician.

If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF ON SKIN: Wash with plenty of soap and water.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

If skin irritation or rash occurs: Get medical advice/attention.

Take off immediately all contaminated clothing and wash it before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Disposal

Dispose of contents/container in accordance with local/national regulation.

Specific Physical and Chemical hazards

Heating may cause fire.

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Mixture

Common name, synonyms: Formalin

Ingredient name: Formaldehyde

Content (%): 35.0 ~ 38.0

Chemical formula: CH₂O

Chemicals No, Japan: 2-482

CAS No.: 50-00-0

MW: 30.03

ECNO: 200-001-8

Ingredient name: Water

Content (%): Residual quantity of the ingredient mentioned above

Chemical formula: H₂O

CAS No.: 7732-18-5

MW: 18.02

ECNO: 231-791-2

Stabilizing additives

Methanol : 5.0 ~ 10.0%

Note : The figures shown above are not the specifications of the product.

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.

Immediately call a POISON CENTER/doctor/physician.

Keep victim warm and quiet.

Call emergency medical service.

Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.

Give artificial respiration if victim is not breathing.

Administer oxygen if breathing is difficult.

If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing.

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

Remove and isolate contaminated clothing and shoes.

In case of burns, immediately cool affected skin for as long as possible with chilled water. Do not remove clothing if adhering to skin.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth. Do NOT induce vomiting.

Call a POISON CENTER/doctor/physician if you feel unwell.

Most important symptoms and effects, both acute and delayed

(Symptoms when inhalation or ingestion)

Cough. Sore throat. Burning sensation behind the breastbone. Headache. Shortness of breath.

Burns in mouth and throat. Nausea. Abdominal pain. Shock or collapse.

(Symptoms when skin and/or eye contact)

Conjunctival redness of the eyes. Redness of the skin. Pain. Severe burns. Watering of the eyes.

Indication of any immediate medical attention and special treatment needed

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water mist, foam, dry powder, CO2 to extinguish.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Cool container with water spray.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

PUBLIC SAFETY: Ventilate closed spaces before entering.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

EVACUATION : Spill: See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Environmental precautions

Avoid release to headsprings, rivers, lakes, ocean and groundwater.

Fire or Explosion : Runoff may pollute waterways.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

- Collect spillage.
- Stop leak if you can do it without risk.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Prevent entry into waterways, sewers, basements or confined areas.
- Do not get water inside containers.
- Keep out of low areas.

Section 7. Handling and storage**Precautions for safe handling****Preventive measures**

(Exposure Control for handling personnel)

- Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

(Exhaust/ventilator)

- Exhaust/ventilator should be available.

(Safety treatments)

- Avoid contact with skin.
- Avoid contact with eyes.

Safety Measures

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.
- When using do not eat, drink or smoke.

Any incompatibilities

- Acids, Strong oxidizing agents, Reducing agents should not be mixed with the chemicals.

Advice on general occupational hygiene

- Wash contaminated parts thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Contaminated work clothing should not be allowed out of the workplace.
- Take off immediately all contaminated clothing and wash it before reuse.

Storage**Conditions for safe storage**

- Store in a well-ventilated place. Keep container tightly closed.
- Keep cool. Protect from sunlight.
- Store in accordance with local/national regulation.
- Store locked up.

Container and packaging materials for safe handling data is not available.

Specific end use(s)

- See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

Section 8. Exposure controls/personal protection**Control parameters****Control value**

(Formaldehyde)

Japan control value (2007) ≤ 0.1 ppm

(Methanol)

Japan control value (1995) ≤ 200 ppm

Adopted value

(Formaldehyde)

JSOH(2007) 0.1ppm, 0.12mg/m³; (ceiling) 0.2ppm, 0.24mg/m³

ACGIH(2017) TWA: 0.1ppm;

STEL: 0.3ppm (URT & eye irr; URT cancer)

Notation···DSEN; RSEN

(Methanol)

JSOH(1963) 200ppm; 260mg/m³

ACGIH(2009) TWA: 200ppm;

STEL: 250ppm (Headache; eye dam; dizziness; nausea)

Notation···Skin

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Recommended respiratory protection: Gas mask(e.g. JIS T8152)

Hand protection

Wear protective gloves. Recommended material(s): butyl rubber

Inspect before use and replace worn or damaged gloves.

Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions.

Chemical-resistant, impervious gloves complying with an approved standard (e.g. JIS T8116) should be used.

Eye protection

Wear chemical safety goggle.

Wear eye/face protection.

Skin and body protection

Wear impervious clothing and boots in case of repeated or prolonged treatment.

Personal protective equipment for the body and skin should be selected based on the task being performed and the risks involved.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless-clear

Odor: Irritant odor

Odor threshold: 0.5~1.0 ppm(as Formaldehyde)

Melting point/Freezing point data is not available.

Boiling point or initial boiling point: 98°C(37% Formaldehyde solution, methanol free)

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point: (c.c.)83°C(37% Formaldehyde solution, methanol free)

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

Self-Accelerating Decomposition Temperature/SADT data is not available.

pH data is not available.

Dynamic viscosity data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Miscible

Solubility in solvent: Miscible in ethanol.

n-Octanol/water partition coefficient data is not available.

Vapor pressure: 0.2 kPa (20°C)(37% Formaldehyde solution, methanol free)

Vapor density data is not available.

Density and/or relative density: 1.085~1.100g/ml(20°C)

Relative vapor density (Air=1): 1.03 (37% Formaldehyde solution, methanol free)

Relative density of the Vapor/air - mixture at 20°C (Air = 1): 1.00 (37% Formaldehyde solution, methanol free)

Particle characteristics data is not available.

Other information

Critical temperature data is not available.

Evaporation rate data is not available.

VOC data is not available.

Section 10. Stability and Reactivity**Reactivity**

Runaway polymerization may occur without stabilizer/inhibitor or when heated.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Reacts with acids and strong oxidants.

Conditions to avoid

Contact with incompatible materials.

Open flames. Heating.

Incompatible materials

Acids, Strong oxidizing agents, Reducing agents

Hazardous decomposition products

Carbon oxides

Section 11. Toxicological Information

The product has not been subjected to toxicological testing. Refer to the available data on the constituents.

Information on toxicological effects**Acute toxicity****Acute toxicity (Oral)****[Product]**

Category 4, Harmful if swallowed

[Data for components of the product]**[GHS Cat. Japan, base data]**

(Formaldehyde)

rat LD50=600~700mg/kg, 800mg/kg (SIDS, 2003)

(Methanol)

human LD50=ca. 1400mg/kg (DFGOT vol.16, 2001)

Acute toxicity (Dermal)**[Product]**

Category 3, Toxic in contact with skin

[Data for components of the product]**[GHS Cat. Japan, base data]**

(Formaldehyde)

rabbit LD50=270mg/kg (HSDB, Access on Jun. 2017)

(Methanol)

rabbit LD50=15800mg/kg (DFGOT vol.16, 2001)

Acute toxicity (Inhalation)

[Product]

Category 2, Fatal if inhaled

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

gas: rat LC50=480ppm/4hr (SIDS, 2003)

(Methanol)

vapor: rat LC50 >31500ppm/4hr (DFGOT vol.16, 2001)

Irritant properties

Skin corrosion/irritation

[Product]

Category 1, Causes severe skin burns and eye damage

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

rat (37% aqueous solution) skin damage/40min, (2.5% or more) microvascular leak

(REACH Registration dossier, Accessed Oct. 2022)

Serious eye damage/irritation

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

human/rabbit eyes irritation (EHC 89, 1989)

(Methanol)

rabbit category 2 : Draize test (EHC 196, 1997)

Sensitization

Respiratory sensitization

[Product]

Category 1, May cause allergy or asthma symptoms or breathing difficulties if inhaled

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

cat. 1; JSOH airway Gr.2, 2007; CICAD 40, 2002; DFGOT, 2014, Access on Jun. 2017

Skin sensitization

[Product]

Category 1, May cause an allergic skin reaction

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

cat. 1A; JSOH Occupational sensitizers/skin Group 1 (OEL Documentations (JSOH), 2021);

Formalin (37% formaldehyde aqueous solution): mouse/positive (LLNA) (EU CLP CLH, 2021)

Germ cell mutagenicity

[Product]

Category 2, Suspected of causing genetic defects

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

cat. 2; NITE Initial Risk Assessment Report, 2006; NICNAS, 2006; ATSDR, 1999

Carcinogenicity

[Product]

Category 1A, May cause cancer

[Data for components of the product]

[GHS Cat. Japan, base data]

(Formaldehyde)

cat.1A; IARC Gr.1 (IARC 100F, 2012); NTP K (NTP RoC, 14th, 2016); ACGIH A1 (ACGIH 7th, 2017)

[IARC]

(Formaldehyde)

Group 1 : Carcinogenic to humans

[ACGIH]

(Formaldehyde)

A1(2017) : Confirmed Human Carcinogen

[JSOH]

(Formaldehyde)

Group 2A: The agents which are probably or possibly carcinogenic to humans

[NTP]

(Formaldehyde)

Known : Known to be Human Carcinogens

[EU]

(Formaldehyde)

Category 1B; Substances presumed to have carcinogenic potential for humans

Reproductive toxicity

[Product]

Category 1B, May damage fertility or the unborn child

[Data for components of the product]

[GHS Cat. Japan, base data]

(Methanol)

cat. 1B; mouse : PATTY 5th, 2001

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]

Category 1, Causes damage to organs

Category 2, May cause damage to organs

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Formaldehyde)

nervous system, respiratory system (NITE Initial Risk Assessment Report, 2006; SIDS, 2003; EHC 89, 1989)

(Methanol)

central nervous system, organ of vision, systemic toxicity (DFGOT vol.16, 2001)

[cat.3 (narcotic effects)]

[GHS Cat. Japan, base data]

(Methanol)

narcotic effect (PATTY 5th, 2001)

STOT-repeated exposure

[Product]

Category 1, Causes damage to organs through prolonged or repeated exposure

Category 2, May cause damage to organs through prolonged or repeated exposure

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Formaldehyde)

central nervous system, respiratory system (JSOH, 2007; ACGIH 7th, 2015; NITE Initial Risk

Formaldehyde solution, JUNSEI CHEMICAL CO., LTD., 69360jis_J_E1-3,21/Dec/2023

Assessment Report, 2006; CICAD 40, 2002; CaPSAR, 1999, EHC 89, 1989; MOE Environmental Risk Assessment for Chemical Substances, vol.1, 2002)

(Methanol)

central nervous system, organ of vision (ACGIH 7th, 2001)

Aspiration hazard

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Section 12. Ecological Information

The product has not been subjected to ecotoxicological testing. Refer to the available data on the constituents.

Toxicity

Aquatic toxicity

[Product]

Category 2, Toxic to aquatic life

Category 3, Harmful to aquatic life with long lasting effects

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

(Formaldehyde)

Algae (*Desmodesmus subspicatus*) ErC50=4.89mg- a.i./L/72hr (Ecotoxicol Environ Safety 54: 346-354)

※a.i.: active ingredient

(Methanol)

Crustacea (Brine shrimp) LC50=900.73mg/L/24hr (EHC196, 1998)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

(Formaldehyde)

Crustacea (*Ceriodaphnia dubia*) NOEC=1.0mg/L/7days (AICIS IMAP, 2006)

Water solubility

[Data for components of the product]

(Formaldehyde)

400000 mg/L (SRC PHYSPROP Database, 2005)

(Methanol)

100 g/100 ml (PHYSPROP_DB, 2009)

Persistence and degradability

[Data for components of the product]

(Formaldehyde)

Rapidly degradable

[BOD_Degradation : 87~ 96% (METI Existing Chemical Substances Safety Inspections Data, 1988)]

Bioaccumulative potential

[Data for components of the product]

(Formaldehyde)

log Kow=0.35 (SRC PHYSPROP Database, 2005)

(Methanol)

log Pow=-0.74 (ICSC, 2018)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container in accordance with local/national regulation.

Section 14. Transport Information

UN No., UN CLASS

UN Number or ID Number : 2209

UN Proper Shipping Name : FORMALDEHYDE SOLUTION with not less than 25% formaldehyde

Class or division (Transport hazard class) : 8

Packing group : III

ERG GUIDE No.: 153

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2209

UN Proper Shipping Name : FORMALDEHYDE SOLUTION with not less than 25% formaldehyde

Class or division (Transport hazard class) : 8

Packing group : III

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2209

UN Proper Shipping Name : FORMALDEHYDE SOLUTION with not less than 25% formaldehyde

Class or division (Transport hazard class) : 8

Hazard labels : Corrosive

Packing group : III

Environmental hazards

Marine pollutants (yes/no) : no

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

Noxious Liquid Substances ; Cat. Y

Formaldehyde; Methanol

Non Noxious Liquid Substances ; Cat. OS

Water

MARPOL Annex V – HME (Harmful to the Marine Environment)

Carcinogenicity: cat.1, 1A, 1B

Formaldehyde

Reproductive toxicity: cat.1, 1A, 1B

Methanol

Specific target organ toxicity – repeated exposure: cat.1

Formaldehyde; Methanol

Section 15. Regulatory Information

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

Labor Standards Act, Japan

Chemical substances or compounds (including alloys) causing disease (Regulation, Appended Table1-2-4-1)

Formaldehyde; Methanol

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

50-00-0; 67-56-1; 7732-18-5

All components are listed or exempted.

Superfund Amendments and Reauthorizations Act (SARA), Title III

SARA 313 (TRI)

Formaldehyde; Methanol

Other regulatory information

We are not able to check up the regulatory information with regard to the substances in your country or region, therefore, we request this matter would be filled by your responsibility.

Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility.

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Regulatory information in this section are limited to intentional ingredient(s), but does not contain information on non-intentional ingredients or impurities which are not informed by supplier(s).

Chemical safety assessment

Advice on safe handling for this product can be found in sections 7 and 8 of this SDS.

Section 16. Other information

GHS classification and labelling

H227-Flammable liquids, Category 4: H227 Combustible liquid

H302-Acute toxicity, Category 4: H302 Harmful if swallowed

H311-Acute toxicity, Category 3: H311 Toxic in contact with skin

H330-Acute toxicity, Category 2: H330 Fatal if inhaled

H314-Skin corrosion/irritation, Category 1: H314 Causes severe skin burns and eye damage

H319-Serious eye damage/eye irritation, Category 2: H319 Causes serious eye irritation

H334-Respiratory sensitization, Category 1: H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

H317-Skin sensitization, Category 1: H317 May cause an allergic skin reaction

H341-Germ cell mutagenicity, Category 2: H341 Suspected of causing genetic defects

H350-Carcinogenicity, Category 1A: H350 May cause cancer

H360-Reproductive toxicity, Category 1B H360 May damage fertility or the unborn child

H370-STOT - single exposure, Category 1: H370 Causes damage to organs

H371-STOT - single exposure, Category 2: H371 May cause damage to organs

H372-STOT - Repeated exposure, Category 1: H372 Causes damage to organs through prolonged or repeated exposure

H373-STOT - Repeated exposure, Category 2: H373 May cause damage to organs through prolonged or repeated exposure

H401-Hazardous to the aquatic environment, short-term (acute), Category 2: H401 Toxic to aquatic life

H412-Hazardous to the aquatic environment, long-term (chronic), Category 3: H412 Harmful to aquatic life with long lasting effects

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN
IMDG Code, 2020 Edition (Incorporating Amendment 40-20)

IATA Dangerous Goods Regulations (64th Edition) 2023

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2023 TLVs and BEIs. (ACGIH)

JIS Z 7252 : 2019

JIS Z 7253 : 2019

2022 Recommendation on TLVs (JSOH)

Notification No. 0111-1 (January 11, 2022), Chemical Hazards Control Division, Industrial
Safety and Health Department, Labour Standards Bureau, MHLW in Japan

Supplier's data/information

Chemicals safety data management system "GHS Assistant" Version 4.25 (<https://www.asahi-ghs.com/>)

NITE Chemical Risk Information Platform "NITE-CHRIP"

(https://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop)

GHS Classification Guidance for Enterprises 2019 Revised Edition (Ver. 2.0) (Mar. 2020, METI)

Abbreviations and acronyms

SDS (Safety Data Sheet)

LD50 (Lethal Dose, 50%)

LC50 (Lethal Concentration, 50%)

IARC (International Agency for Research on Cancer)

ACGIH (American Conference of Governmental Industrial Hygienists)

EPA (US Environmental Protection Agency)

NTP (US National Toxicology Program)

JSOH (Japan Society for Occupational Health)

EU (European Union)

EC50 (Effective Concentration, 50%)

NOEC (No Observed Effect Concentration)

BOD (Biochemical Oxygen Demand)

COD (Chemical Oxygen Demand)

BCF (Bioconcentration Factor)

anh (anhydride)

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2022), EU official data (Consolidated version of the CLP Regulation published in 17/12/2022 and Commission delegated regulation (EU) 2022/692 (ATP18)).