

SAFETY DATA SHEET

Formaldehyde 100 %

Date of issue: 2020-05-15

Revision date: 2020-01-16

Version: 3.0

1. IDENTIFICATION

A. Product name

- Formaldehyde 100 %

B. Recommended use and restriction on use

- General use : Not available
- Restriction on use : Not available

C. Manufacturer / Supplier / Distributor information

o Manufacturer information

- Company name : RIGAS Co.,Ltd
- Address : 46,Munpyeongseo-ro 17 beon-gil, Daedeok-gu,Daejeon, KOREA
- Dept. : Management Planning Dept.
- Telephone number : 82-42-934-6900
- Emergency telephone number : 82-42-934-6900
- Fax number : 82-42-935-8814
- E-mail address : master@rigas.co.kr

o Supplier/Distributor information

- Company name : RIGAS Co.,Ltd
- Address : 46,Munpyeongseo-ro 17 beon-gil, Daedeok-gu,Daejeon, KOREA
- Dept. : Management Planning Dept.
- Telephone number : 82-42-934-6900
- Emergency telephone number : 82-42-934-6900
- Fax number : 82-42-935-8814
- E-mail address : master@rigas.co.kr

2. HAZARD IDENTIFICATION

A. GHS Classification

- Flammable gases : Category1
- Gases under pressure : Liquefied gas
- Acute toxicity (oral) : Category3
- Acute toxicity (dermal) : Category3
- Acute toxicity (inhalation: gas) : Category1
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2
- Respiratory sensitization : Category1
- Skin sensitization : Category1
- Germ cell mutagenicity : Category2
- Carcinogenicity : Category1A
- Specific target organ toxicity(Single exposure) : Category1
- Specific target organ toxicity(Repeated exposure) : Category1

B. GHS label elements

o Hazard symbols



○ **Signal words**

- Danger

○ **Hazard statements**

- H220 Extremely flammable gas
- H280 Compressed gas ; Contains gas under pressure; may explode if heated
- H301 Toxic if swallowed
- H311 Toxic in contact with skin
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H330 Fatal if inhaled
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H341 Suspected of causing genetic defects
- H350 May cause cancer
- H370 Causes damage to organs(Refer Section SDS 11)
- H372 Causes damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

○ **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P260 Do not breathe gas/mist/vapours/spray.
- P261 Avoid breathing gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P284 Wear respiratory protection.
- P285 In case of inadequate ventilation wear respiratory protection.

2) Response

- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P307+P311 If exposed: Call a POISON CENTER or doctor/physician.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P310 Immediately call a POISON CENTER or doctor/physician.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P320 Specific treatment is urgent
- P321 Specific treatment
- P330 Rinse mouth.
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
- P361 Remove/Take off immediately all contaminated clothing.
- P362 Take off contaminated clothing and wash before reuse.
- P363 Wash contaminated clothing before reuse.
- P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- P381 Eliminate all ignition sources if safe to do so.

3) Storage

- P403 Store in a well-ventilated place.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.
- P410+P403 Protect from sunlight. Store in a well-ventilated place.

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification

- Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Formaldehyde	Formaldehyde ; Formalin ; Methanal ; Methyl Aldehyde ; Methylene Glycol ; Methylene Oxide ; Oxomethane ; Oxomethylene ; Oxymethylene	50-00-0	100

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contact lenses if worn.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.
- Accidental contact with liquefied gas or refrigerated liquefied gas may cause burn, severe mayhem and perfrigeration, so please take emergency medical action.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- In case of accidental contact with liquefied gas or refrigerated liquefied gas, warm up the contact part with lukewarm water.
- Remove contaminated clothing, shoes and isolate.
- Take the doctor's examination.
- Wash thoroughly after handling.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.
- Keep away from exposed sources immediately.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Flush skin with plenty of wter for at least 15 minutes while removing contaminated clothing and shoes.
- Get medical attention immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.
- Remove to fresh air and keep at rest in a position comfortable for breathing.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- high-pressure gas; May explode when heated.

C. Special protective actions for firefighters

- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Leaking gas fire: do not extinguish, unless leak can be stopped safely.
- Remove sources of ignition.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Move container to safe area from the leak area.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away, isolate hazard area and deny entry.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notify the central and local government if the emission reach the standard threshold.
- Disposal of waste shall be in compliance with the Wastes Control Act
- Appropriate container for disposal of spilled material collected.
- Spilled material should be treated as a potential risk of waste collected.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Refer to Engineering controls and personal protective equipment.
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.
- Avoid contact with heat, sparks, flame or other ignition sources.
- Contaminated work clothing should not be allowed out of the workplace.
- Handling only authorized person.

B. Conditions for safe storage, including any incompatibilities

- Save in cool, dry and well ventilated place.
- Check regularly for leaks.

- Do not use damaged containers.
- Do not apply direct heat.
- Prevent static electricity and keep away from combustible materials or heat sources.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.
- Store in well ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

- **ACGIH TLV**
 - [Formaldehyde] : TWA 0.1 ppm, STEL 0.3 ppm
- **OSHA PEL**
 - Not available

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

- **Respiratory protection**
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Any chemical cartridge respirator with organic vapor cartridge(s).
 - Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
 - Any air-purifying respirator with a full facepiece and an organic vapor canister.
 - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- **Eye protection**
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- **Hand protection**
 - Wear appropriate chemical resistant glove.
- **Skin protection**
 - Wear appropriate chemical resistant protective clothing.
- **Others**
 - Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	HCHO
- Appearance	Gas
- Color	Colorless
B. Odor	pungent odor
C. Odor threshold	1 ppm
D. pH	Not available
E. Melting point/Freezing point	-92 °C
F. Initial Boiling Point/Boiling Ranges	-21 °C
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	400 mmHg @ -33 C
L. Solubility	Soluble: alcohol, ether, acetone, benzene, chloroform
M. Vapour density	1.07 (air = 1)

N. Specific gravity	0.815 @ -20 C
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	30.03

10. STABILITY AND REACTIVITY

A. Chemical Stability

- high-pressure gas; May explode when heated.
- May form explosive mixture.

B. Possibility of hazardous reactions

- Contact with other combustible material may cause fire.
- Cylinders exposed to fire may vent and release flammable gas.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

- **(Respiratory tracts)**
 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- **(Oral)**
 - Toxic if swallowed
- **(Eye·Skin)**
 - Causes serious eye irritation
 - Causes skin irritation
 - May cause an allergic skin reaction

B. Delayed and immediate effects and also chronic effects from short and long term exposure

- **Acute toxicity**
 - * **Oral**
 - [Formaldehyde] : LD50 460 mg/kg Rat (OECD TG 401, ECHA)
 - * **Dermal**
 - [Formaldehyde] : LD50 270 mg/kg rabbit (EHC 89 1989)
 - * **Inhalation**
 - [Formaldehyde] : gas LC50 480 ppm 4 hr Rat (SIDS)
- **Skin corrosion/irritation**
 - Causes skin irritation
- **Serious eye damage/irritation**
 - Causes serious eye irritation
- **Respiratory sensitization**
 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- **Skin sensitization**
 - May cause an allergic skin reaction
- **Carcinogenicity**
 - * **IARC**

- [Formaldehyde] : Group 1
- * **OSHA**
 - [Formaldehyde] : Applicable
- * **ACGIH**
 - [Formaldehyde] : A1
- * **NTP**
 - [Formaldehyde] : K
- * **EU CLP**
 - [Formaldehyde] : Carc. 2
- **Germ cell mutagenicity**
 - Suspected of causing genetic defects
- **Reproductive toxicity**
 - Not available
- **STOT-single exposure**
 - Causes damage to organs
- **STOT-repeated exposure**
 - Causes damage to organs through prolonged or repeated exposure
- **Aspiration hazard**
 - Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

- **Fish**
 - [Formaldehyde] : LC50 1.41 mg/ℓ 96 hr Oncorhynchus mykiss (ECOTOX)
- **Crustaceans**
 - [Formaldehyde] : EC50 14 mg/ℓ 48 hr Daphnia magna (ECOTOX)
- **Algae**
 - Not available

B. Persistence and degradability

- **Persistence**
 - [Formaldehyde] : log Kow 0.35 (ICSC)
- **Degradability**
 - [Formaldehyde] : BOD5/COD 0.74 (IUCLID)

C. Bioaccumulative potential

- **Bioaccumulative potential**
 - Not available
- **Biodegradation**
 - [Formaldehyde] : 91 (%) 28 day (IUCLID)

D. Mobility in soil

- [Formaldehyde] : logKow = 0.35 (1)

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them
- Oil water separation technology shall be applied as pre-waste treatment if it is applicable
- It shall be treated by incineration

B. Special precautions for disposal

- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act

- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG)

- 1198

B. Proper shipping name

- FORMALDEHYDE, SOLUTIONS, FLAMMABLE

C. Hazard Class

- 3

D. IMDG CODE/IATA DGR Packing group

- III

E. Marine pollutant

- Not applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : F-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-C (Flammable corrosive liquids)

15. REGULATORY INFORMATION

A. National and/or international regulatory information

- **POPs Management Law**
 - [Formaldehyde] : Not applicable
- **Information of EU Classification**
 - * **Classification**
 - [Formaldehyde] : H351, H331, H311, H301, H314, H317
- **U.S. Federal regulations**
 - * **OSHA PROCESS SAFETY (29CFR1910.119)**
 - [Formaldehyde] : 453.599 kg 1000 lb
 - * **CERCLA Section 103 (40CFR302.4)**
 - [Formaldehyde] : 45.3599 kg 100 lb
 - * **EPCRA Section 302 (40CFR355.30)**
 - [Formaldehyde] : 226.7995 kg 500 lb
 - * **EPCRA Section 304 (40CFR355.40)**
 - [Formaldehyde] : 45.3599 kg 100 lb
 - * **EPCRA Section 313 (40CFR372.65)**
 - [Formaldehyde] : Applicable
- **Rotterdam Convention listed ingredients**
 - Not applicable
- **Stockholm Convention listed ingredients**
 - Not applicable
- **Montreal Protocol listed ingredients**
 - Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2020-05-11

C. Revision number and Last date revised

- 3 times, 2020-01-16

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).