

Name of the product	Fluoroform (CHF ₃)
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1. Chemical product and corporate information.

- A. Name of the product Fluoroform
- B. Recommended use of the product and limitation of the usage.
 Recommended use of the product A medium of the organic synthesizer, refrigerant of the infrared element, urethane synthetic baking powder
 Limitation of the usage: No data available.
- C. Supplier's information.(In case of imported product, state the supplier's information for emergency contact)
 Name of the corporate: FEWM Co. LTD
 Address: 53, Jeungpyeong2sandan-ro, Doan-myeon, .
 Jeungpyeong-gun, Chungcheongbuk-do
 Emergency Contact: 043)838-9562

2. Hazards. Maleficence

- A. Hazards. Maleficence classification High-pressure gas: liquefied gas.
- B. Cautionary statements including the measures for safety.
 Symbolics



Signals

Hazards wordings

Preventional wordings

Prevention

Response

Storage

Disposal

- C. Other hazards and maleficence not included in the standards of the category of hazards and maleficence (NFPA)

Warning

H280 Includes high-pressure gas: May explode on heating

No data available.

No data available.

P410+P403 Avoid sunlight and keep in a well-ventilated area.

No data available.

Sanitation	1
Fire	0
Reactivity	0

3. Title and content of the component

Name of the component	Fluoroform
Nickname (Trivial name)	TRIFLUOROMETHANE:
CAS no	75-46-7
Content (%)	100%

4. Emergency measures.

A. If in eyes

Take emergency medical measures.

B. If on skin

In the case of hot material, place the affected area in a large amount of cold water and wash it.

Take emergency medical measures.

Remove the contaminated clothing and shoes and quarantine the contaminated area.

In case of contact with the liquid gas, melt the area with lukewarm water.

When contact with the gas or the liquid gas, it may cause a burn, serious injury, frostbite.

C. If inhaled

Take emergency medical measures.

Move it to the area with fresh air.

In case of not breathing, execute artificial respiration.

Keep warm and in rest.

Provide oxygen if breathing is difficult.

D. If swallowed.

Take emergency medical measures.

E. Major symptoms/result, acute and chronic

No data available.

F. Other cautions to doctor

Do not inject the adrenaline.

Make sure that the medical personnel is aware of the material and take protective measures.

5. Measures in case of explosion, fire.

A. Recommended (prohibited) extinguisher.

Use dry sand or soil when extinguishment by smothering.

In the case of extinguishment concerned with this material, use alcohol foam, carbon dioxide or water spray.

B. Specific hazard from the chemical component

The vapor may cause dizziness or suffocation without awareness.

In the case of fire, irritating, corrosive, toxic gas may be formed.

It may burn partly but it is not easy to ignite.

The container may explode on heating.

Warning: part of it leave inflammable remains after vaporization.

Includes high-pressure gas: May explode on heating.

C. Protective equipment when fire-fighting and prevention measures.

Remove the container from the area of fire if it is safe to do so.

Be careful as the damaged container may fly.

Be careful as the liquid gas spreads on the ground as it is heavier than the air.

Fight fire away from the region from a reasonable distance.

In the case of tank fire, as there is a risk of freezing, do not wet the source of leakage or safety facility.

Handle damaged cylinder only by a specialist.

Stay away from the tank in flame in case of tank fire.

Immediately refrain in case of tank fire, if there is noise from the pressure relief equipment or discoloration to the tank.

In the case of tank fire, cool the container with a large amount of water after the extinguishment.

In case of tank fire, extinguish at the maximum distance or use an unmanned extinguisher.

6. Measures in case spillage

A. Required measures and protections to protect the body.

If possible, turn the container of the leakage and let it release as a gas rather than liquid.

Do not touch the spillage or walk around.

Do not wet the source of spillage directly.

Reduce the vapor using water spray, or avoid the contact of water with the spillage by disheveling the steam point.

Ventilate the contaminated area.

Do not enter the area in the condition without appropriate protections such as air respirator or air supplied respirator until appropriate oxygen is obtained.

If not dangerous, stop the spillage.

Pay attention as part of it leaves flammable remains after vaporization.

Pay attention to the materials and conditions to avoid.

B. Environmental measures.

Prevent entering the waterway, drainage, basement, confined area.

C. Purification or removal methods.

For fire fighting purposes, build embankment and collect water.

7. Handling and storage measures.

A. Safety measures.

Do not pressurize, cut, weld, solder, connect, pierce, grind or expose to heat, fire, spark, static or other sources of ignition.

Check the density of oxygen before entering the area as there is a risk of unconsciousness or death due to lack of oxygen in the state of high-density oxygen.

Be careful as suffocation may occur in a confined area by reducing the density of the oxygen in the air when the material leaks.

Work with reference to engineering maintenance and personal protection.

Pay attention to the material and conditions to avoid.

As there could be remains of the material to the container after it has been emptied, hence follow all the MSDS/label preventional measures.

B. Safe storage measures.

The pressure of the container could rise when exposed to heat hence refrain from exposure to heat.

Pay attention to the material and conditions to avoid.

Avoid direct sunlight and keep in a well-ventilated area.

8. Prevention of spillage and personal protection.

A. Exposure standards of the chemical material, biological exposure standards etc.

Domestic Regulations No data available.

ACGIH Regulation No data available.

Biological exposure standards No data available.

B. Appropriate engineering maintenance. No data available.

C. Personal protection

Respiratory protection Use the respiratory protection that has completed the inspection by the Korea Occupational Safety and Health Agency as per the characteristics of the exposed material.

Eye protection No data available.

Hand protection No data available.

Body protection No data available.

9. Physicochemical characteristic.

A. External

Shape Gas Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)

Color No color Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)

- B. Odor Odorless Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)
- C. Odor threshold No data available.
- D. pH No data available.
- E. Melting point/ freezing point -155.8 C Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)
- F. Initial boiling point and boiling point range -82.1 C Source: National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>)
- G. Ignition point -112 C Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)
- H. Vaporization speed No data available.
- I. Inflammability (solid, vapor) No data available.
- J. Upper limit or lower limit of the range of ignition or explosion -/- (No data available.)
- K. Steam pressure 35300 mmHg Source: National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>)
- L. Solubility 4090 mg/l Source: National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>)
- M. Vapor density 2.4 Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)
- N. Specific gravity No data available.
- O. n-octanol-water partition coefficient 0.64 Source: National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>)
- P. Auto-ignition temperature No data available.
- Q. Decomposition temperature (>260 C)
- R. Viscosity 0.0144cP (at 25 C)
- S. Molecular weight 70.01 Source: The Chemical Database. The Department of Chemistry at the University of Akron (<http://ull/chemistry.uakron.edu/erd>)

10. Stability and reactivity

- A. Chemical stability and hazardous reactivity
Includes high-pressure gas: May explode on heating
The container may explode when heated.
It may burn partly but it is not easy to ignite.
The vapor may cause dizziness or suffocation without awareness.
In the case of fire, irritating, corrosive, toxic gas may be formed.
- B. Conditions to avoid Heat
- C. Materials to avoid No data available
- D. Harmful decomposed product Irritating, corrosive, toxic gas.

11. Toxicological information.

A. Information on routes of exposure of high possibility.

Could be absorbed to the body by inhalation.

B. Health hazards information.

Acute toxicity

Oral No data available.

Skin No data available.

Inhalation No data available.

Skin corrosion or irritation Sporadic irritation. Causes skin frostbite on contact.

Source: National Library of Medicine/Chemical Carcinogenesis Research Information System (NLM/CCRIS)

(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS>)

Source: International Chemical Safety Cards (ICSC)

(<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm>)

Serious eye damage or irritation Sporadic irritation.

Source: National Library of Medicine/Chemical Carcinogenesis Research Information System (NLM/CCRIS)

(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS>)

Respiratory sensitization No data available.

Skin sensitizations No data available.

Carcinogenicity No data available.

Occupation safety and health acts

Notice of Ministry of Employment and Labor No Data Available.

IARC No Data Available.

OSHA No Data Available.

ACGIH A4 (Fluorides)

NTP No data available.

EU CLP No data available.

Germ-cell mutagenicity No data available.

Reproductive toxicity No data available.

Specific target organ systemic toxicity (Single exposure) No data available.

Specific target organ systemic toxicity (Repeated exposure) No data available.

Aspirations respiratory tract hazards No data available.

12. Effects on the environment.

A. Ecotoxicity

Fish LC50 1121.984 mg/l 96 hr.

Source: Ecological Structure Activity Relationships (ECOSAR)

Crustacean EC50 1089.900 mg/l 48 hr

Source: Ecological Structure Activity Relationships (ECOSAR)

Algae EC50 627.895 mg/l 96 hr.

Source: Ecological Structure Activity Relationships (ECOSAR)

Persistent	log Kow 0.64 Source: National Library of Medicine (NLM) (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM)
Degradability	No data available.

Condenasability	BCF 3.2
Biodegradability	No data available.

D. Mobility in soil	No data available
E. Other adverse effects	No data available

13. Disposal considerations.

A. Methods of waste disposal

Dispose of the content and container as per the regulations if stated in the waste control act.

B. Cautious measures when disposal.

Consider the regulations if stated in the waste control act.

14. Information required for transport.

A. UN No.	1984
B. Proper shipping name	TRIFLUOROMETHANE (Refrigerant gas R
23)	
C. Transportation hazard classification	2.2
D. If applied, the packing group	-
E. Marine pollution (Marine pollutant material)	No data available.
F. Special transport measures to the transport or the transportation and precautionary conditions that the user should know.	

Emergency measures in case of fire	F-C
Emergency measures in case of spillage	S-V

15. Legal regulatory status.

A. Regulations by occupation safety and health acts	Not Applicable
B. Regulations by Chemicals control Act	Not Applicable.
C. Regulations by Safety Control of Dangerous Substances	Not Applicable.
D. Regulations by waste control act	Not Applicable.

E. Regulations by domestic and foreign law.

Other domestic regulations. Not Applicable.

Persistent organic pollutants control act Not Applicable.

Foreign regulations

The USA knowledge management (OSHA Regulations) Not Applicable.

The USA knowledge management (CERCLA Regulations) Not Applicable.

The USA knowledge management (EPCRA 302 Regulations) Not Applicable.

The USA knowledge management (EPCRA 304 Regulations) Not Applicable.

The USA knowledge management (EPCRA 313 Regulations) Not Applicable.

The USA knowledge management (EPCRA 302 Regulations) Not Applicable.

The USA knowledge management (Materials of Rotterdam agreement) Not Applicable.

The USA knowledge management (Materials of Stockholm agreement) Not Applicable.

The USA knowledge management (Materials of Montreal protocol) Not Applicable.

EU Classification(result of definite classification) Not Applicable.

EU Classification (Hazard text) Not Applicable.

EU Classification (Safety text) Not Applicable.

16. Other information.

A. Source of reference.

Ecological Structure Activity Relationships (ECOSAR) (crustacean)

Ecological Structure Activity Relationships (ECOSAR) (fish)

Ecological Structure Activity Relationships (ECOSAR) (Algae)

Emergency Response Guidebook (2008)

HSDB (Condenasability)

HSDB (Soil mobility)

ICSC (Information on routes of exposure of high possibility)

International Chemical Safety Cards (ICSC)

(<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm>) (Skin corrosiveness or irritation)

National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>) (n-octanol/water partition coefficient (Kow))

National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>) (solubility)

National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>) (Persistent)

National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>) (steam pressure)

National Library of Medicine (NLM) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>) (Initial boiling point and boiling point range)

National Library of Medicine/Chemical Carcinogenesis Research Information System (NLM/CCRIS) (<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS>) (Serious eye damage or Irritation)

The Chemical Database, The Department of Chemistry at the University of Akron

(<http://ull.chemistry.uakron.edu/erd>) (odor)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (melting point/freezing point)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (molecular weights)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (color)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (shape)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (ignition point)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry/uakron.edu/erd>) (vapor density)

B. Initial date of preparation 1st August 2017

C. Number of revision and first date of issue

Number of revision times

Last date of revision 0

D. Miscellaneous

<p>The issued Material safety data sheet (MSDA) is document edited and partly amended by referencing the MSDS provided by Korea Occupational Safety and Health Agency</p>
