

## Safety Data Sheet



### 1. Identification of the Substance/Mixture and the Supplier

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)  
 Address : 1-3-1 Kasumigaseki, Chiyoda, Tokyo, Japan  
 Office in Charge : Reference Materials Office, Center for Quality Management of Metrology, National Metrology Institute of Japan (NMIJ)  
 Person in Charge : Certified Reference Material Staff  
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 Emergency Contact : Same as above

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 ID Number : 4064001

Identity of Substance/Mixture : Certified Reference Material NMIJ CRM 4064-a  
 Ethan  
 Recommended Use of the Chemical and Restriction on Use : This reference material can be used in calibration of instruments. In addition, it is intended as raw material for preparation of standard gases. Do not use this reference material for other purposes than testing/research.  
 This CRM is a reference material (specified in the Japanese Industrial Standard (JIS) Q 0030).

### 2. Hazards Identification

GHS classification : Flammable / flammable gas : Hazard Category 1  
 High-pressure gas : Compressed or liquefied gas  
 Specific target organ toxicity/Systemic toxicity (Single exposure) : Hazard Category 3 (Narcotic effects)

GHS label element :



Signal word : Danger  
 Hazard and toxicity : Extremely flammable/inflammable gas  
 Pressurized gas: May explode if heated  
 May cause drowsiness or dizziness  
 Precautionary statement : [Safety Precaution]  
 Keep away from heat/hot surfaces/sparks/open flames and other ignition sources. No smoking.  
 Wear heat-resistant gloves/eye protection/face protection.  
 Avoid breathing gas.  
 Use only outdoors or in a well-ventilated area.

[First-Aid Measure]

Leaking gas fire: Do not extinguish, unless the leak can be stopped safely.

In case of leakage: Eliminate all ignition sources.

If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Call a doctor/physician if you feel unwell.

[Storage]

Handle this reference material in accordance with the High Pressure Gas Safety Act.

Store a cylinder away from direct sunlight and fire in a well-ventilated area at a temperature of 40 °C or less.

[Disposal]

Dispose of this CRM in accordance with applicable legislation and local government ordinance. Entrust disposal of this CRM to a professional waste disposal company licensed by the prefectural governor.

Inside Japan, return the cylinder of this CRM to the supplier when it is no longer needed or exceeds its shelf life.

Hazards other than those listed above have not resulted in classification or are not classifiable.

### 3. Composition/Information on Ingredients

Substance or mixture	:	Single substance
Chemical name	:	Ethane
Synonym	:	Dimethyl
Chemical formula	:	C <sub>2</sub> H <sub>6</sub>
Molecular weight	:	30.07
CAS number	:	74-84-0
Content	:	99 % or above
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : 2-2 Industrial Safety and Health Act : Published

### 4. First-aid Measures

If Inhaled	:	Remove victim to fresh air and keep him/her warm and at rest. Seek medical examination/ treatment when you feel unwell.
If on Skin	:	Rinse away thoroughly with clean water. Remove/Take off immediately all contaminated clothing, shoes, etc. Seek medical examination/ treatment when you feel unwell.
If in Eyes	:	Rinse cautiously with water for several minutes. If eye irritation persists/If you feel unwell: Seek medical examination/ treatment.
If Swallowed	:	Rinse mouth thoroughly with water. Call doctor/physician if you feel unwell.

The Most Critical Characteristics and Symptoms of Expected Acute Symptoms and Delayed Symptoms : Simple-asphyxiating gas

Protection of First-Aid Provider : Use personal protective equipment.

## 5. Fire-fighting Measures

Extinguishing Media : In the early stage of firefighting, use extinguishing media such as powder, carbon dioxide, or a dry chemical extinguishing system and equipment.  
For major fires and large quantities, use water spray and water fog.

Unsuitable Extinguishing Media : Direct water jets

Fire-Specific Hazards : May ignite easily.  
Heating may cause of cylinders of this reference material to explode.  
Fire may cause emission of irritating or toxic fume (or gas).  
Extremely flammable/inflammable gas

Specific Fire-Fighting Method : Do not extinguish unless the leak can be stopped safely.  
Eliminate all ignition sources if safe to do so.  
Remove cylinders of this reference material the vicinity of the fire if safe to do so.  
Stay in an area where gas cannot stagnate and fight the fire from the windward direction. Take actions to prevent leakage.  
If the cylinders cannot be moved, cool them and their surroundings with sprayed water  
Cool cylinders thoroughly with plenty of water, even after the fire has been extinguished.  
Do not directly spray water on leaking points and safety mechanisms because they may become frozen.  
Fight fire using normal precautions from a reasonable distance.  
Cool the surrounding facilities with water spray to prevent their temperature rising due to radiation heat.  
If firefighting is considered too high-risk due to the state of surroundings and leakage, let the fire burn all the gas in the cylinder while spraying water onto surroundings to prevent the fire spreading.

Protection of Fire-Fighters : Firefighting should be conducted from the windward direction to avoid breathing hazardous gas. Use personal protective equipment, such as fireproof clothing, fire-resistant clothing, protective clothing, compressed air open-circuit self-contained breathing apparatus, compressed oxygen closed-circuit self-contained breathing apparatus, rubber gloves and rubber boots.

## 6. Accidental Release Measures

Personal Precaution	:	Eliminate surrounding ignition sources promptly. Make fire-fighting kit available to prepare for potential ignition. Use appropriate personal protective equipment to avoid contact with eyes and skin and inhalation of gas.
Personal Protective Equipment and Emergency Procedures	:	Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. Use appropriate personal protective equipment during the operation to avoid inhalation of gas.
Environmental Precautions	:	No data available
Recovery and Neutralization	:	No data available
Prevention of Secondary Disaster	:	Eliminate all ignition sources promptly (No smoking/sparks/flame allowed in the vicinity areas). Prevent the spillage from flowing into gutters, drains, basement rooms and confined space. Do not spray water directly to spillage or its sources. Isolate to the affected areas until the gas diffuses.

## 7. Handling and Storage

### Handling

Engineering Precautions	:	Fire is strictly prohibited.
Local and General Ventilation	:	Use local and general ventilation.
Precautions for Safe Handling	:	Do not use hot surfaces/sparks/fire in surrounding areas. Contains gas under pressure; may explode if heated. Avoid rough handling of cylinders, such as shock and turning over. Take sufficient precautions against leakage when mounting and dismounting cylinders. After use, fully close valves, and equip with an outlet cap and protection cap. Leakage may result in ignition/explosion. Do not contact with, inhale, or swallow this reference material. Do not breathe gas. Exposure to eyes or mouth may cause irritation. Use this reference material with great care. Inhalation in sufficient quantities may cause asphyxiation. Use only outdoors or in a well-ventilated area.

### Storage

Appropriate Storage Conditions	:	Store away from ignition sources, such as heat, sparks, and open flames. No smoking Store in a well-ventilated area. Store away from oxidizers, oxygen, explosives, halogen, compressed air, acids, bases, foods, chemicals, etc. Keep cylinder away from direct sunlight and fire and store at a temperature of 40 °C or less. Keep cylinder tightly closed and store in a well-ventilated area. Store in a locked area.
Incompatible	:	Strong oxidizers.

Materials

Safe Container : Use containers stipulated in the High-Pressure Gas Safety Act  
Packaging Material : and/or the UN Transportation Codes.

※ Please refer to the certificate regarding details of appropriate storage conditions and precautions for use as reference material.

## 8. Exposure Controls/Personal Protection

Threshold Limit Value

Not specified

Permissible Concentration

- ACGIH TLV-TWA : 1000 ppm
- Values recommended by Japan Society for Occupational Health : Not specified
- OSHA PEL TWA : Not specified

Engineering Controls

- Ventilation/Exhaust : Explosion-proof local or general ventilation system
- Safety control/  
Gas detection : Measuring equipment, Detecting tube
- Storage Precautions : Ventilation along floor surface. Keep cylinder tightly closed. Keep away from flammable substances, reducing substances and strong oxidizers.

Personal Protective Equipment (PPE)

- Respiratory System : Gas mask for organic gases, Compressed air open-circuit SCBA
- Hands : Protective gloves
- Eyes : Safety goggles
- Skin and Body : Protective clothing, Face shield

Hygiene Measures

Handle this reference material in accordance with the industrial health and safety codes.

## 9. Physical and Chemical Properties

- Appearance, etc. : Compressed liquefied gas
- Color : Colorless
- Odor : Odorless
- pH : No data
- Melting point :  $-183\text{ }^{\circ}\text{C}$
- Boiling point :  $-89\text{ }^{\circ}\text{C}$
- Flashing point :  $-130\text{ }^{\circ}\text{C}$
- Explosive range : Lower limit 3.0 vol%  
Upper limit 12.5 vol%
- Vapor pressure : 3850 kPa(20 °C)
- Relative vapor density(Air=1) : 1.05
- Specific gravity or bulk specific gravity : 0.572 ( $-108.4\text{ }^{\circ}\text{C}/4\text{ }^{\circ}\text{C}$ )
- Solubility : 47 ml/l (20 °C) in water

	460 ml/l(4 °C) in alcohol
• <i>n</i> -Octanol/water partition coefficient (Log Po/w)	: 1.81
• Auto-ignition temperature	: 472 °C
• Decomposition temperature	: No data
• Flammability	: No data
• Viscosity	: 0.0090 mPa·s(20 °C)

## 10. Stability and Reactivity

### ◇Stability

- Easy to mix with the air to generate explosive mixtures

### ◇Reactivity

- Flow/agitation, etc. may generate static electricity.

### ◇Hazardous Reactivity

- Reacts with strong oxidizers.

### ◇Conditions to Avoid

- Hot surfaces/sparks/open flame

### ◇Incompatible substance

- Strong oxidizers

### ◇Hazardous Decomposition Products

- Combustion in case of fire emits harmful gases such as carbon monoxide and carbon dioxide.

## 11. Toxicological Information

Specific target organ toxicity/Systemic toxicity (Single exposure)	At a high concentration, narcotic effects or central nerve system inhibition is observed.
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## 12. Ecological Information

### Toxicity

- No data available

### Persistence and Degradability

- No data available

### Bioaccumulative Potential

- No data available

### Mobility in soil

- No data available

### Ozone depletion potential

- No data available

## 13. Disposal Considerations

Return this reference material back to the office in charge, as shown in “1. Identification of the Substance/Mixture and the Supplier” when it is no longer needed or exceeds its shelf life.

- Return the gas cylinder to its owner.
  - The cylinder will be disposed of by its owner in accordance with relevant legislation.  
The user must not dispose of cylinder without the owner’s consent.
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#### 14. Transport Information

UN number : 1035  
UN classification : High-pressure gas  
Material name : Ethan  
Container grade : -  
ICAO/IATA : Class 2.1  
Marine pollutant : Not applicable  
Precautions : Avoid direct sunlight, pay attention to leaks due to falling, overturning, etc. and flames carefully. Transport this reference material carefully.

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#### 15. Regulatory Information

- ◇Industrial Safety and Health Law
    - Dangerous substance /Flammable gas (Enforcement Order Appendix 1-4)
  - ◇High Pressure Gas Safety Act
    - Compressed gas/Liquefied gas (Act Article 2 -1 and -3)
  - ◇Ship Safety Law
    - High-pressure gas (Dangerous Material Rule Articles 2 and 3: Dangerous Material Announcement Appendix 1)
  - ◇Civil Aeronautics Act
    - High pressure gas (Enforcement Order Article 194: Dangerous Material Announcement Appendix 1)
- ◎ **This SDS is originally prepared for the use of the material in Japan, thus the stated laws and regulations are stipulated and carried out in Japan. The use of the material in other countries should be referred to and by application of the relevant laws and regulations of the country in which the material will be used.**
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#### 16. Other Information

Others

The information in this document is not intended to be exhaustive and is based on currently available information and data. The measures given in this document are applicable only to normal handling conditions. When handling this reference material under special conditions etc., it is recommended to take safety measures appropriate to each specific application and context of use. This document is intended to provide information and not intended to guarantee anything in handling this reference material.

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