Right to Know

Hazardous Substance Fact Sheet

Common Name: **ISOBUTANE**

Synonyms: 1,1-Dimethylethane; Trimethylmethane

Chemical Name: Propane, 2-Methyl-

Date: March 1999 Revision: March 2008

CAS Number: 75-28-5

RTK Substance Number: 1040

DOT Number: UN 1969

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Description and Use

Isobutane is a colorless gas, with a faint gasoline odor, which is usually shipped as a liquid under pressure. It is used as a refrigerant, fuel, and aerosol propellant, and in rubber. It also occurs in cigarette smoke.

Reasons for Citation

- **Isobutane** is on the Right to Know Hazardous Substance List because it is cited by ACGIH, DOT, NIOSH, DEP, NFPA and EPA.
- This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

- Immerse affected part in warm water. Seek medical attention.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

Hazard Summary

Hazard Rating	NJDOH	NFPA
HEALTH	-	0
FLAMMABILITY	-	4
REACTIVITY	-	0

FLAMMABLE
POISONOUS GASES ARE PRODUCED IN FIRE
CONTAINERS MAY EXPLODE IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

- **Isobutane** can affect you when inhaled.
- **Isobutane** *vapor* can irritate and burn the skin and eyes.
- Contact with the *liquid* can cause frostbite.
- Inhaling **Isobutane** can irritate the nose and throat.
- Exposure to high concentrations can cause dizziness, lightheadedness, irregular heartbeat and passing out.
- Very high levels can cause suffocation from lack of *Oxygen* with loss of consciousness, convulsions, coma and death.
- **Isobutane** is a FLAMMABLE GAS and a DANGEROUS FIRE HAZARD.

Workplace Exposure Limits

NIOSH: The recommended airborne exposure limit (REL) is **800 ppm** averaged over a 10-hour workshift.

ACGIH: The threshold limit value (TLV) is **1,000 ppm** (as *Aliphatic hydrocarbon gases*) averaged over an 8-hour workshift.

- **Isobutane** decreases the amount of available *Oxygen*. Routinely measure *Oxygen* content to make sure it is at least 19.5% by volume.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **Isobutane**:

- **Isobutane** *vapor* can irritate and burn the skin and eyes.
- Contact with the *liquid* can cause frostbite.
- Inhaling **Isobutane** can irritate the nose and throat causing coughing and wheezing.
- Exposure to high concentrations can cause dizziness, lightheadedness, irregular heartbeat, disorientation and passing out.
- Very high levels can cause suffocation from lack of *Oxygen* with loss of consciousness, convulsions, coma and death.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **Isobutane** and can last for months or years:

Cancer Hazard
- According to the information presently available to the New Jersey Department of Health, **Isobutane** has not been tested for its ability to cause cancer in animals.

Reproductive Hazard
- According to the information presently available to the New Jersey Department of Health, **Isobutane** has not been tested for its ability to affect reproduction.

Other Effects
- No chronic (long-term) health effects are known at this time.

Medical

Medical Testing
There is no special test for this chemical. However, seek medical attention if illness occurs or overexposure is suspected.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA *Compressed gases* Standard (29 CFR 1910.101).
- Before entering a confined space where **Isobutane** is present, check to make sure sufficient *Oxygen* (19.5%) exists.
- Before entering a confined space where **Isobutane** may be present, check to make sure that an explosive concentration does not exist.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **Isobutane**. Wear personal protective equipment made from material which can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.
- Where exposure to cold equipment, vapors, or liquid may occur, employees should be provided with *insulated Neoprene* or *Rubber* gloves and special clothing designed to prevent the freezing of body tissues.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- Wear non-vented, impact resistant goggles when working with fumes, gases, or vapors.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- Where the potential exists for exposure over **800 ppm**, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.
- Exposure to **Isobutane** is dangerous because it can replace *Oxygen* and lead to suffocation. Only NIOSH approved self-contained breathing apparatus with a full facepiece operated in the positive pressure mode should be used in *Oxygen* deficient environments.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- **Isobutane** is a FLAMMABLE GAS.
- Stop flow of gas or let fire burn itself out.
- POISONOUS GASES ARE PRODUCED IN FIRE.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to disperse gas, keep fire-exposed cylinders cool, and to protect individuals attempting to stop leak.
- Vapors may travel to a source of ignition and flash back.
- Vapor is heavier than air and may travel a distance to cause a fire or explosion far from the source.

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Isobutane** is leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Ventilate area of leak to disperse the gas.
- Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.
- Turn leaking cylinder with the leak up to prevent the escape of gas in the liquid state.
- Keep **Isobutane** out of confined spaces, such as sewers, because of the possibility of an explosion.
- It may be necessary to contain and dispose of **Isobutane** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Isobutane** you should be trained on its proper handling and storage.

- **Isobutane** reacts with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); ACETYLENE; NITROGEN OXIDES; and mixtures of NICKEL CARBONYL and OXYGEN causing fire and explosions.
- Store in tightly closed containers in a cool, well-ventilated area.
- Sources of ignition, such as smoking and open flames, are prohibited where **Isobutane** is used, handled, or stored.
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- Use explosion-proof electrical equipment and fittings wherever **Isobutane** is used, handled, manufactured, or stored.
- Use only non-sparking tools and equipment, especially when opening and closing cylinders of **Isobutane**.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Acute Exposure Guideline Levels (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

Emergency Response Planning Guideline (ERPG) values are intended to provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database maintained by federal EPA. The database contains information on human health effects that may result from exposure to various chemicals in the environment.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **ISOBUTANE**

Synonyms: 1,1-Dimethylethane; Trimethylmethane
CAS No: 75-28-5
Molecular Formula: C_4H_{10}
RTK Substance No: 1040
Description: Colorless gas or liquid under pressure with a faint gasoline odor

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
0 - Health **4 - Fire** **0 - Reactivity** **DOT#:** UN 1969 **ERG Guide #:** 115 **Hazard Class:** 2.1 (Flammable gas)	FLAMMABLE GAS Stop flow of gas or let fire burn itself out. POISONOUS GASES ARE PRODUCED IN FIRE. CONTAINERS MAY EXPLODE IN FIRE. Use water spray to disperse gas, keep fire-exposed cylinders cool, and to protect individuals attempting to stop leak. Vapors may travel to a source of ignition and flash back. Vapor is heavier than air and may travel a distance to cause a fire or explosion far from the source.	**Isobutane** reacts with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); ACETYLENE; NITROGEN OXIDES; and mixtures of NICKEL CARBONYL and OXYGEN causing fire and explosions.

SPILL/LEAKS

Isolation Distance:

Small Spills: 100 meters (330 feet)

Large Spills: 800 meters (1/2 mile)

Fire: 1,600 meters (1 mile)

Before entering a confined space where **Isobutane** is present, check to make sure sufficient *Oxygen* (19.5%) exists.

Keep **Isobutane** out of confined spaces, such as sewers, because of the possibility of an explosion.

PHYSICAL PROPERTIES

Odor Threshold:	Gasoline odor
Flash Point:	-117°F (-83°C)
LEL:	1.8%
UEL:	8.4%
Auto Ignition Temp:	860°F (460°C)
Vapor Density:	2 (air = 1)
Vapor Pressure:	2,611 mm Hg at 77°F (25°C)
Water Solubility:	Slightly soluble
Boiling Point:	11°F (-11.7°C)
Ionization Potential:	10.74 eV
Molecular Weight:	58.1

EXPOSURE LIMITS

OSHA:	None
NIOSH:	800 ppm, 10-hr TWA
ACGIH:	1,000 ppm, 8-hr TWA (as *Aliphatic hydrocarbon gases*)

PROTECTIVE EQUIPMENT

Gloves:	Insulated Neoprene or Rubber
Coveralls:	Clothes designed to prevent freezing of body tissues
Respirator:	>800 ppm - Supplied air

HEALTH EFFECTS

Eyes:	Irritation and burns
Skin:	Irritation and burns
	Contact with the liquid can cause frostbite.
Inhalation:	Nose and throat irritation with coughing and wheezing
	Dizziness, irregular heartbeat, convulsions, loss of consciousness, coma and death

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.

Immerse affected part in warm water. Seek medical attention.

Begin artificial respiration if breathing has stopped and CPR if necessary.

Transfer to a medical facility.