Right to Know

# Hazardous Substance Fact Sheet

Common Name: **ISOAMYL ALCOHOL**

Synonyms: Isopentyl Alcohol; Isobutylcarbinol

Chemical Name: 1-Butanol, 3-Methyl-

Date: April 1999 Revision: March 2008

CAS Number: 123-51-3

RTK Substance Number: 1039

DOT Number: UN 1105

## Description and Use

**Isoamyl Alcohol** is a colorless liquid with a strong *Alcohol*-like odor. It is used in photographic chemicals and pharmaceutical products, as a solvent, as a flavor in food, and in the manufacture of other chemicals.

- **ODOR THRESHOLD = 0.042 ppm**
- Odor thresholds vary greatly. Do not rely on odor alone to determine potentially hazardous exposures.

## Reasons for Citation

- **Isoamyl Alcohol** is on the Right to Know Hazardous Substance List because it is cited by OSHA, ACGIH, DOT, NIOSH and NFPA.

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**

- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

**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**

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

## Hazard Summary

| Hazard Rating | NJDOH | NFPA |
|---|---|---|
| HEALTH | - | 1 |
| FLAMMABILITY | - | 2 |
| REACTIVITY | - | 0 |

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

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

- **Isoamyl Alcohol** can affect you when inhaled and by passing through the skin.
- Contact can severely irritate and burn the skin and eyes with possible eye damage.
- Inhaling **Isoamyl Alcohol** can irritate the nose, throat and lungs.
- **Isoamyl Alcohol** can cause nausea, vomiting and diarrhea.
- Exposure can cause headache, dizziness, lightheadedness, and passing out.
- Prolonged or repeated exposure can cause drying and cracking of the skin.
- **Isoamyl Alcohol** may affect the liver and kidneys.

## Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is **100 ppm** averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit (REL) is **100 ppm** averaged over a 10-hour workshift and **125 ppm**, not to be exceeded during any 15-minute work period.

ACGIH: The threshold limit value (TLV) is **100 ppm** averaged over an 8-hour workshift and **125 ppm** as a STEL (short-term exposure limit).

- The above exposure limits are for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

## 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 **Isoamyl Alcohol**:

- Contact can severely irritate and burn the skin and eyes with possible eye damage (corneal necrosis).
- Inhaling **Isoamyl Alcohol** can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath.
- **Isoamyl Alcohol** can cause nausea, vomiting and diarrhea.
- Exposure can cause headache, dizziness, lightheadedness, and passing out.

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

***Cancer Hazard***
- There is limited evidence that **Isoamyl Alcohol** causes cancer in animals. It may cause cancer of the liver, spleen and leukemia.

***Reproductive Hazard***
- According to the information presently available to the New Jersey Department of Health, **Isoamyl Alcohol** has been tested and has not been shown to affect reproduction.

***Other Effects***
- **Isoamyl Alcohol** can irritate the lungs. Repeated exposure may cause bronchitis to develop with coughing, phlegm, and/or shortness of breath.
- Prolonged or repeated exposure can cause drying and cracking of the skin.
- **Isoamyl Alcohol** may affect the liver and kidneys.

## Medical

**Medical Testing**
For frequent or potentially high exposure (half the PEL or greater), the following are recommended before beginning work and at regular times after that:

- Liver function tests

If symptoms develop or overexposure is suspected, the following are recommended:

- Lung function tests
- Kidney function tests

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).

**Mixed Exposures**
- Smoking can cause heart disease, lung cancer, emphysema, and other respiratory problems. It may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.
- More than light alcohol consumption can cause liver damage. Drinking alcohol may increase the liver damage caused by **Isoamyl Alcohol**.

## 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.

## 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 **Isoamyl Alcohol**. 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.
- Safety equipment manufacturers recommend *Butyl*, *Neoprene* and *Viton* for gloves and DuPont *Tychem*® *CPF 2*, *SL*, *CPF 4*, *CSM*, and *Responder*®; Kappler® *Zytron® 500*; and Saint-Gobain *ONESuit®TEC*, or the equivalent, as protective materials for clothing.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

**Eye Protection**

- Wear indirect-vent, impact and splash resistant goggles when working with liquids.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.
- Do not wear contact lenses when working with this substance.

**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 **100 ppm**, use a NIOSH approved full facepiece respirator with an organic vapor cartridge. Increased protection is obtained from full facepiece powered-air purifying respirators.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Isoamyl Alcohol**, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
- Consider all potential sources of exposure in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Exposure to **500 ppm** is immediately dangerous to life and health. If the possibility of exposure above **500 ppm** exists, use a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode equipped with an emergency escape air cylinder.

## 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).

- **Isoamyl Alcohol** is a COMBUSTIBLE LIQUID.
- Use dry chemical, $CO_2$, water spray or alcohol-resistant foam as extinguishing agents.
- POISONOUS GASES ARE PRODUCED IN FIRE.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to keep fire-exposed containers cool.
- 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 **Isoamyl Alcohol** is spilled or leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
- Ventilate and wash area after clean-up is complete.
- DO NOT wash into sewer.
- It may be necessary to contain and dispose of **Isoamyl Alcohol** 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 **Isoamyl Alcohol** you should be trained on its proper handling and storage.

- **Isoamyl Alcohol** reacts violently with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES); and HYDROGEN TRISULFIDE to cause an explosion hazard.
- **Isoamyl Alcohol** is not compatible with ACID CHLORIDES; ACID ANHYDRIDES; ALIPHATIC AMINES; CAUSTICS; ISOCYANATES; and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).
- Store in tightly closed containers in a cool, well-ventilated area.
- Sources of ignition, such as smoking and open flames, are prohibited where **Isoamyl Alcohol** is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
- Use only non-sparking tools and equipment, especially when opening and closing containers of **Isoamyl Alcohol**.

## 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: **ISOAMYL ALCOHOL**

Synonyms: Isopentyl Alcohol; Isobutylcarbinol
CAS No: 123-51-3
Molecular Formula: $C_5H_{12}O$
RTK Substance No: 1039
Description: Colorless liquid with a strong *Alcohol*-like odor

## HAZARD DATA

| Hazard Rating | Firefighting | Reactivity |
|---|---|---|
| **1 - Health**<br>**2 - Fire**<br>**0 - Reactivity**<br>**DOT#:** UN 1105<br>**ERG Guide #:** 129<br>**Hazard Class:** 3 (Flammable liquid) | **Isoamyl Alcohol** is a COMBUSTIBLE LIQUID.<br>Use dry chemical, $CO_2$, water spray or alcohol-resistant foam as extinguishing agents.<br>POISONOUS GASES ARE PRODUCED IN FIRE.<br>CONTAINERS MAY EXPLODE IN FIRE.<br>Use water spray to keep fire-exposed containers cool.<br>Vapor is heavier than air and may travel a distance to cause a fire or explosion far from the source. | **Isoamyl Alcohol** reacts violently with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES); and HYDROGEN TRISULFIDE to cause an explosion hazard.<br>**Isoamyl Alcohol** is not compatible with ACID CHLORIDES; ACID ANHYDRIDES; ALIPHATIC AMINES; CAUSTICS; ISOCYANATES; and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC). |

## SPILL/LEAKS

**Isolation Distance:**

Small Spill: 50 meters (160 feet)

Large Spill: 300 meters (1,000 feet)

Fire: 800 meters (1/2 mile)

Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.

DO NOT wash into sewer.

Dangerous to aquatic life in high concentrations.

## PHYSICAL PROPERTIES

| | |
|---|---|
| **Odor Threshold:** | 0.042 ppm |
| **Flash Point:** | 109°F (43°C) |
| **LEL:** | 1.2% |
| **UEL:** | 9% |
| **Auto Ignition Temp:** | 662°F (350°C) |
| **Vapor Density:** | 3.04 (air = 1) |
| **Vapor Pressure:** | 2.1 mm Hg at 68°F (20°C) |
| **Specific Gravity:** | 0.82 (water = 1) |
| **Water Solubility:** | Slightly soluble |
| **Boiling Point:** | 270°F (132°C) |
| **Molecular Weight:** | 88.2 |

## EXPOSURE LIMITS

| | |
|---|---|
| **OSHA:** | 100 ppm, 8-hr TWA |
| **NIOSH:** | 100 ppm, 10-hr TWA; 125 ppm, 15-min STEL |
| **ACGIH:** | 100 ppm, 8-hr TWA; 125 ppm, 15-min STEL |
| **IDLH:** | 500 ppm |

## PROTECTIVE EQUIPMENT

| | |
|---|---|
| **Gloves:** | Butyl, Neoprene and Viton (>8-hr breakthrough) |
| **Coveralls:** | DuPont Tychem® CPF 2, SL, CPF 4, CSM, and Responder®; Kappler® Zytron® 500; and Saint-Gobain ONESuit® TEC (>8-hr breakthrough) |
| **Respirator:** | >100 ppm - APR with Organic vapor cartridge or Supplied air<br>>500 ppm - SCBA |

## HEALTH EFFECTS

| | |
|---|---|
| **Eyes:** | Irritation and burns |
| **Skin:** | Irritation, burns, drying and cracking |
| **Inhalation:** | Nose, throat and lung irritation with coughing, wheezing and/or shortness of breath<br>Headache, nausea, vomiting, dizziness and passing out |

## 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, while rinsing.

**Quickly** remove contaminated clothing and wash contaminated skin with large amounts of soap and water.

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

**Transfer** to a medical facility.