



Right to Know Hazardous Substance Fact Sheet

Common Name: **AMMONIUM NITRATE**

Synonyms: Nitram; Ammonia Nitrate

Chemical Name: Nitric Acid, Ammonium Salt

Date: June 1998

Revision: July 2007

CAS Number: 6484-52-2

RTK Substance Number: 0106

DOT Number: UN 1942

Description and Use

Ammonium Nitrate is an odorless, colorless, white to gray crystalline (sand-like) flake, bead or granule. It is used to make explosives, matches, fertilizers, and antibiotics.

Reason for Citation

- ▶ **Ammonium Nitrate** is on the Right to Know Hazardous Substance List because it is cited by DOT and NFPA.
- ▶ 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 cool water for at least 15 minutes, occasionally 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 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 PAGE 6

Hazard Summary

Hazard Rating	NJDHSS	NFPA
HEALTH	-	2
FLAMMABILITY	-	0
REACTIVITY	-	3
REACTIVE POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE OXIDIZER		

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

- ▶ **Ammonium Nitrate** can affect you when inhaled and by passing through your skin.
- ▶ Contact can irritate and burn the skin and eyes.
- ▶ Inhaling **Ammonium Nitrate** can irritate the nose, throat and lungs.
- ▶ High levels may cause *methemoglobinemia* with headache, fatigue, and a blue color to the skin and lips.
- ▶ **Ammonium Nitrate** is REACTIVE and a DANGEROUS EXPLOSION HAZARD.

Workplace Exposure Limits

No occupational exposure limits have been established for **Ammonium Nitrate**. This does not mean that this substance is not harmful. Safe work practices should always be followed.

- ▶ It should be recognized that **Ammonium Nitrate** can be absorbed through your skin, thereby increasing your exposure.

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 and Senior Services Hazardous Substance Fact Sheet, available on the RTK Program 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) requires private 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 **Ammonium Nitrate**:

- ▶ Contact can irritate and burn the skin and eyes.
- ▶ Inhaling **Ammonium Nitrate** can irritate the nose, throat and lungs.
- ▶ Overexposure can cause nausea, vomiting, flushing of the face and neck, headache, weakness and collapse.
- ▶ High levels can interfere with the ability of the blood to carry *Oxygen* causing headache, fatigue, dizziness, and a blue color to the skin and lips (*methemoglobinemia*). Higher levels can cause trouble breathing, collapse and even death.

Chronic Health Effects

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

Cancer Hazard

- ▶ According to the information presently available to the New Jersey Department of Health and Senior Services, **Ammonium Nitrate** 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 and Senior Services, **Ammonium Nitrate** 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

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

- ▶ Blood methemoglobin level

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.
- ▶ When vacuuming, a high efficiency particulate air (HEPA) filter should be used, not a standard shop vacuum.

In addition, the following may be useful or required:

- ▶ Before entering a confined space where **Ammonium Nitrate** may be present, check to make sure that an explosive concentration does not exist.
- ▶ Use a vacuum or a wet method to reduce dust during clean-up. **DO NOT DRY SWEEP.**

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 **Ammonium Nitrate**. Wear personal protective equipment made from material which can not be permeated and/or degraded by this substance. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- ▶ Safety equipment manufacturers recommend *Butyl* or *Neoprene* for gloves and *CHEMFAB Challenger® 5200* as protective material for clothing.
- ▶ All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- ▶ Wear eye protection with side shields or goggles.
- ▶ Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

Improper use of respirators is dangerous. Such equipment should only be used if the employer has 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).

- ▶ For field applications check with your supervisor and your safety equipment supplier regarding the appropriate respiratory equipment.
- ▶ Where the potential exists for overexposure to **Ammonium Nitrate**, use a NIOSH approved negative pressure, air purifying, particulate filter respirator. The filter classifications of dust/mist/fume, paint spray or pesticide prefilters, and filters for radon daughters, have been replaced with the N, R, and P series. Each series has three levels of filtering efficiency: 95%, 99%, and 99.9%.

- ▶ Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Ammonium Nitrate**, (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.
- ▶ Be sure to consider all potential exposures 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.
- ▶ Where the potential for high exposure exists, 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.

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).

- ▶ To extinguish fire, flood with water.
- ▶ **DO NOT USE** dry chemical, CO₂ or halogenated extinguishing agents.
- ▶ **POISONOUS GASES ARE PRODUCED IN FIRE**, including *Nitrogen Oxides* and *Ammonia*.
- ▶ **CONTAINERS MAY EXPLODE IN FIRE.**
- ▶ Use water spray to keep fire-exposed containers cool.
- ▶ **Ammonium Nitrate** may ignite combustibles (wood, paper and oil).

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 **Ammonium Nitrate** is spilled, take the following steps:

- ▶ Evacuate personnel and secure and control entrance to the area.
- ▶ Eliminate all ignition sources.
- ▶ Collect with a clean shovel and place into noncombustible containers.
- ▶ Ventilate and wash area after clean-up is complete.
- ▶ Keep **Ammonium Nitrate** out of a confined space, such as a sewer, because of the possibility of an explosion.
- ▶ It may be necessary to contain and dispose of **Ammonium Nitrate** 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 **Ammonium Nitrate** you should be trained on its proper handling and storage.

- ▶ **Ammonium Nitrate** is a STRONG OXIDIZER and when contaminated with OIL, CHARCOAL, or other ORGANIC MATERIALS, can EXPLODE and become SENSITIVE TO SHOCK.
- ▶ **Ammonium Nitrate** reacts with STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).
- ▶ **Ammonium Nitrate** is not compatible with REDUCING AGENTS; COMBUSTIBLES; STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); POWDERED METALS; METAL SALTS; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); PHOSPHORUS; UREA; and SULFUR.
- ▶ Store in tightly closed containers in a cool, well-ventilated area away from MOISTURE. Containers should be protected from physical damage, shock, heat, and contamination.
- ▶ Sources of ignition, such as smoking and open flames, are prohibited where **Ammonium Nitrate** is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
- ▶ Wherever **Ammonium Nitrate** is used, handled, manufactured, or stored, use explosion-proof electrical equipment and fittings.

Occupational Health Information Resources

The New Jersey Department of Health and Senior Services, Occupational Health Service, 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 & Senior Services
Right to Know Program
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>

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are not intended to be copied and sold
for commercial purposes.***

GLOSSARY

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

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/m³ 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.



Common Name: **AMMONIUM NITRATE**

Synonyms: Nitram; Ammonia Nitrate

CAS No: 6484-52-2

Molecular Formula: NH₄NO₃

RTK Substance No: 0106

Description: A colorless to white or gray, crystalline solid or granule

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
<p>2 - Health</p> <p>0 - Fire</p> <p>3- Reactivity</p> <p>DOT ID #: UN 1942</p> <p>ERG Guide #: 140</p> <p>Hazard Class: 5.1 (Oxidizer)</p>	<p>Flood with water.</p> <p>DO NOT USE dry chemical, CO₂ or halogenated extinguishing agents.</p> <p>POISONOUS GASES ARE PRODUCED IN FIRE, including <i>Nitrogen Oxides</i> and <i>Ammonia</i>.</p> <p>CONTAINERS MAY EXPLODE IN FIRE</p> <p>Use water spray to keep fire-exposed containers cool.</p> <p>Evacuate in all directions for 1,600 meters (1 mile) if fire cannot be controlled.</p> <p>Protect from shock.</p>	<p>Ammonium Nitrate is a STRONG OXIDIZER and when contaminated with OIL, CHARCOAL or other ORGANIC MATERIALS, can EXPLODE and become SENSITIVE TO SHOCK.</p> <p>Ammonium Nitrate must be stored to avoid contact with REDUCING AGENTS; COMBUSTIBLES; STRONG ACID (such as HYDROCHLORIC, SULFURIC and NITRIC); POWDERED METALS; METAL SALTS; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); PHOSPHORUS; UREA; and SULFUR.</p> <p>Ammonium Nitrate reacts with STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).</p>

SPILL/LEAKS

Isolation Distance: 10 to 25 meters (30 to 80 feet)

Collect with a clean shovel and place in noncombustible containers.

Keep **Ammonium Nitrate** out of a confined space, such as a sewer, because of the possibility of an explosion.

This material may be hazardous to water quality but will biodegrade.

PHYSICAL PROPERTIES

Odor Threshold:	Odorless
Flash Point:	Nonflammable
LEL:	N/A
UEL:	N/A
Density:	1.7 g/cm ³
Water Solubility:	Soluble
Melting Point:	336°F (169°C) Decomposes at 410°F (210°C)
Ionization Potential:	No Information
pH:	5.4

EXPOSURE LIMITS

ACGIH:	N/A
OSHA:	N/A
NIOSH:	N/A
IDLH LEVEL:	N/A

PROTECTIVE EQUIPMENT

Gloves:	Butyl or Neoprene
Coverall:	CHEMFAB Challenger® 5200
Boot:	Butyl or Neoprene
Respirator:	N95 for dusts or mists Supplied air for unknown levels or emergency

HEALTH EFFECTS

Eyes:	Irritation and burns
Skin:	Irritation and burns
Acute:	Nose, throat and lung irritation Methemoglobinemia with headache, fatigue and blue color to the skin and lips
Chronic:	Cancer - Not tested No information available

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.

Remove contaminated clothing. Wash contaminated skin with water.

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

Transfer to a medical facility.