Material Safety Data Sheet
Acetic Acid, Glacial

ACC# 00120

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetic Acid, Glacial
Catalog Numbers: S70048, S70048-1SC, S70048SC, A35-500, A35500LC, A38-212, A38-450LB, A38-500, A38-56LB, A38450LB01, A38500LC, A38C-2.5, A38C-212, A38FP 500, A38FP500, A38J500, A38P 500, A38P 20, A38P500, A38S-2.5, A38S-212, A38S-500, A38S212EA, A38SI-212, A465-1, A465-250, A490-212, A490212001, A490212LC, A491-212, A49120, A4914, A491SAM1, A491SAM2, A491SAM3, A492-200L, A492-20L, A492-212L, A492-500, A507-212, A507-500, BP1185-212, BP1185-500, BP1185-PP20, BP2400-500, BP2401-212, BP2401-500, BP2401C-212, BP2401P-20, BP2401S-212, BP2401S-500, BP2401SI-212, BP2401SI21, NC9532182, NC9776814, NC9776815, S70048-1MF*, S70048-1SCMF*, S70048-2MF, S700481MF, S700481SC, S700481SCMF, S700482MF, XXA490EP450LB
Synonyms: Ethanoic acid; Ethylic acid; Glacial acetic acid; Methanecarboxylic acid; Vinegar acid.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
64-19-7	Acetic acid	ca.100	200-580-7

Hazard Symbols: C
Risk Phrases: 10 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 39 deg C. **Danger!** Corrosive. **Flammable liquid and vapor.** Causes severe digestive and respiratory tract burns. Causes severe eye and skin burns. May be harmful if absorbed through the skin. Acetic acid forms ice-like solid below 62°F (17°C).
Target Organs: Teeth, eyes, skin, mucous membranes.

Potential Health Effects
Eye: Causes severe eye irritation. Contact with liquid or vapor causes severe burns and possible irreversible eye damage.
Skin: Causes skin burns. May be harmful if absorbed through the skin. Contact with the skin may cause blackening and hyperkeratosis of the skin of the hands.
Ingestion: May cause severe and permanent damage to the digestive tract. Causes severe pain, nausea,

vomiting, diarrhea, and shock. May cause polyuria, oliguria and anuria. Rapidly absorbed from the gastrointestinal tract.
Inhalation: Effects may be delayed. Causes chemical burns to the respiratory tract. Exposure may lead to bronchitis, pharyngitis, and dental erosion. May be absorbed through the lungs.
Chronic: Chronic exposure to acetic acid may cause erosion of dental enamel, bronchitis, eye irritation, darkening of the skin, and chronic inflammation of the respiratory tract. Acetic acid can cause occupational asthma. One case of a delayed asthmatic response to glacial acetic acid has been reported in a person with bronchial asthma. Skin sensitization to acetic acid is rare, but has occurred.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Persons with pre-existing skin disorders or impaired respiratory or pulmonary function may be at increased risk to the effects of this substance. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Vapors may form an explosive mixture with air. Use water spray to keep fire-exposed containers cool. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Reacts with most metals to form highly flammable hydrogen gas which can form explosive mixtures with air. Flammable liquid and vapor. May be ignited by friction, heat, sparks, or flame. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. For large fires, use water spray, fog or alcohol-resistant foam.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Use water spray to dilute spill to a non-flammable mixture. Avoid runoff into storm sewers and ditches which lead to waterways. Wash area with soap and water. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Cover with material such as dry soda ash or calcium carbonate and place into a closed container for disposal. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid contact with heat, sparks and flame. Do not get on skin or in eyes. Do not ingest or inhale Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep from freezing. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store near alkaline substances. Acetic acid should be kept above its freezing point (62°F), since it will expand as it solidifies and may break container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetic acid	10 ppm TWA; 15 ppm STEL	10 ppm TWA; 25 mg/m3 TWA 50 ppm IDLH	10 ppm TWA; 25 mg/m3 TWA

OSHA Vacated PELs: Acetic acid: 10 ppm TWA; 25 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical goggles.
Skin: Wear appropriate gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless liquid
Odor: pungent odor - vinegar odor
pH: 2.4 (1M), 2.9 (0.1M)
Vapor Pressure: 11.4 mm Hg @ 20 deg C
Vapor Density: 2.10 (Air=1)
Evaporation Rate:0.97 (n-Butyl acetate=1)
Viscosity: 1.22 cP
Boiling Point: 117-118 deg C
Freezing/Melting Point:16.6 deg C
Autoignition Temperature: 426 deg C (798.80 deg F)
Flash Point: 39 deg C (102.20 deg F)
Decomposition Temperature: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 2; Reactivity: 0
Explosion Limits, Lower:4.0 vol %
Upper: 19.9 vol %
Solubility: Soluble in water; releases heat/vapor.
Specific Gravity/Density:1.05 (Water=1)
Molecular Formula:C2H4O2
Molecular Weight:60.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Metals, acetic anhydride, alcohols, amines, ammonium nitrate, chlorine trifluoride, nitric acid, permanganates, peroxides, sodium hydroxide, sodium peroxide, hydrogen peroxides, acetaldehyde, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), acid anhydrides, chlorosulfonic acid, oleum, chromium trioxide, potassium hydroxide, carbonates, bromine pentafluoride, perchloric acid, chromic anhydride, potassium-tert-butoxide, calcium salts, ethyleneimine, Attacks some forms of plastics, rubbers, and coatings., 2-aminoethanol, ethylene diamine, phosphorus trichloride, chromic acid anhydride, phosphorus isocyanate, diallyl methyl carbinol + ozone, nitric acid + acetone, xylene, sodium salts.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 64-19-7: AF1225000
LD50/LC50:
CAS# 64-19-7:
Draize test, rabbit, skin: 50 mg/24H Mild;
Inhalation, mouse: LC50 = 5620 ppm/1H;
Oral, rat: LD50 = 3310 mg/kg;
Skin, rabbit: LD50 = 1060 uL/kg;
Carcinogenicity:
CAS# 64-19-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No teratogenic effects were observed among the offspring of mice, rats, or rabbits that hac been given very large doses of apple cider vinegar (containing acetic acid) during pregnancy.
Reproductive Effects: Intratesticular, rat: TDLo = 400 mg/kg (male 1 day(s) pre-mating) Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females).
Neurotoxicity: No information available.
Mutagenicity: Sister Chromatid Exchange: Human, Lymphocyte = 5 mmol/L.; Unscheduled DNA Synthesis Administration onto the skin, mouse = 79279 ug/kg.; Cytogenetic Analysis: Hamster, Ovary = 10 mmol/L.
Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 88 mg/L; 96 Hr; Static bioassay @ 18-22°C Bluegill/Sunfish: LC50 = 75 mg/L; 96 Hr; Unspecified Goldfish: LC50 = 423 mg/L; 24 Hr; Unspecified flea Daphnia: EC50 = 32-47 mg/L; 24-48 Hr; Unspecified ria: Phytobacterium phosphoreum: EC50 = 8.86-11 mg/L; 5,15,25 min; Microtox test If released to water or soil, acetic acid will biodegrade readily. Evaporation from dry surfaces is likely to occur. When spilled on soil, the liquid will spread on the surface and penetrate into the soil at a rate dependent on the soil type and its water content. Acetic acid shows no potential for biological accumulation or food chain contamination.
Environmental: If released to the atmosphere, it is degraded in the vapor-phase by reaction with

photochemically produced hydroxyl radicals (estimated typical half-life of 26.7 days). It occurs in atmospheric particulate matter in acetate form and physical removal from air can occur via wet and dry deposition.
Physical: Natural waters will neutralize dilute solutions to acetate salts.
Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	ACETIC ACID, GLACIAL				ACETIC ACID GLACIAL
Hazard Class:	8				8(9.2)
UN Number:	UN2789				UN2789
Packing Group:	II				II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 64-19-7 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA

Section 302 (RQ)
CAS# 64-19-7: final RQ = 5000 pounds (2270 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 64-19-7: acute, chronic, flammable.
Section 313
No chemicals are reportable under Section 313.
Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 64-19-7 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 64-19-7 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 10 Flammable.

R 35 Causes severe burns.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 64-19-7: 1

Canada

CAS# 64-19-7 is listed on Canada's DSL List. CAS# 64-19-7 is listed on Canada's DSL List.

This product has a WHMIS classification of B3, E.

CAS# 64-19-7 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 64-19-7: OEL-AUSTRALIA:TWA 10 ppm (25 mg/m3);STEL 15 ppm (37 mg /m3) OEL-AUSTRIA:TWA 10 ppm (25 mg/m3) OEL-BELGIUM:TWA 10 ppm (25 mg /m3);STEL 15 ppm (37 mg/m3) OEL-CZECHOSLOVAKIA:TWA 25 mg/m3;STEL 50 m g/m3 OEL-DENMARK:TWA 10 ppm (25 mg/m3) OEL-FINLAND:TWA 10 ppm (25 mg /m3);STEL 15 ppm (37 mg/m3);Skin OEL-FRANCE:STEL 10 ppm (25 mg/m3) O EL-GERMANY:TWA 10 ppm (25 mg/m3) OEL-HUNGARY:TWA 10 mg/m3;STEL 20 mg/ m3 OEL-INDIA:TWA 10 ppm (25 mg/m3);STEL 15 ppm (37 mg/m3) OEL-JAPAN: TWA 10 ppm (25 mg/m3) OEL-THE NETHERLANDS:TWA 10 ppm (25 mg/m3) OEL-THE PHILIPPINES:TWA 10 ppm (25 mg/m3) OEL-POLAND:TWA 5 mg/m3 OEL-RUS SIA:TWA 10 ppm;STEL 5 mg/m3;Skin OEL-SWEDEN:TWA 10 ppm (25 mg/m3);STE L 15 ppm (35 mg/m3) OEL-SWITZERLAND:TWA 10 ppm (25 mg/m3);STEL 20 ppm (50 mg/m3) OEL-THAILAND:TWA 10 ppm (25 mg/m3) OEL-TURKEY:TWA 10 ppm (25 mg/m3) OEL-UNITED KINGDOM:TWA 10 ppm (25 mg/m3);STEL 15 ppm (35 mg/m3) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 7/21/1999
Revision #5 Date: 4/10/2001

NJ Health
New Jersey Department of Health

Right to Know
Hazardous Substance Fact Sheet

Common Name: **ACETIC ACID**

Synonyms: Glacial Acetic Acid; Ethanoic Acid; Ethylic Acid

Chemical Name: Acetic Acid

Date: June 1998 Revision: July 2007

CAS Number: 64-19-7

RTK Substance Number: 0004

DOT Number: UN 2789

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Description and Use

Acetic Acid is a colorless liquid with a strong vinegar-like odor. It can also be an ice-like solid below 62°F (17°C). It is used in making drugs, dyes, plastics, food additives and insecticides.

- **ODOR THRESHOLD = 0.48 to 1.0 ppm**
- The range of accepted odor threshold values is quite broad. Caution should be used in relying on odor alone as a warning of potentially hazardous exposures.

Reason for Citation

- **Acetic Acid** is on the Right to Know Hazardous Substance List because it is cited by OSHA, ACGIH, DOT, NIOSH, 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 cool water. Continue for at least 30 minutes, occasionally lifting upper and lower lids. Remove contact lenses, if worn, while rinsing. Immediate medical attention is necessary.

Skin Contact

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

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.
- Medical observation is recommended for 24 to 48 hours after breathing overexposure, as pulmonary edema may be delayed.

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	-	3
FLAMMABILITY	-	2
REACTIVITY	-	0

CORROSIVE
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

- **Acetic Acid** can affect you when inhaled.
- Contact can severely irritate and burn the skin and eyes leading to eye damage.
- Inhaling **Acetic Acid** can irritate the nose and throat.
- Inhaling **Acetic Acid** can irritate the lungs. Higher exposures may cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency.
- Repeated exposure can cause thickening and cracking of the skin.

Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is **10 ppm** averaged over an 8-hour workshift.

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

ACGIH: The threshold limit value (TLV) is **10 ppm** averaged over an 8-hour workshift and **15 ppm** as a STEL (short-term exposure limit).

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) 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 **Acetic Acid**:

- Contact can severely irritate and burn the skin and eyes leading to eye damage.
- Inhaling **Acetic Acid** can irritate the nose and throat.
- Inhaling **Acetic Acid** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures may cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.

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

Cancer Hazard
- According to the information presently available to the New Jersey Department of Health, **Acetic Acid** has been tested and has not been shown to cause cancer in animals.

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

Other Effects
- **Acetic Acid** can cause bronchitis to develop with cough, phlegm and/or shortness of breath.
- Repeated exposure can cause thickening and cracking of the skin, particularly the skin of the hands.

Medical

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

- Lung function tests

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

- Chest x-ray

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
- Because smoking can cause heart disease, as well as 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.

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 **Acetic Acid**. 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 *Neoprene* and *Butyl Rubber* for gloves and DuPont *Tychem® CPF4, Responder®, TK, Reflector®* and CHEMFAB *Challenger® 4000* 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.
- Contact lenses should not be worn when working with this substance.
- 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).

- Where the potential exists for exposure over **10 ppm**, use a NIOSH approved full facepiece respirator with an organic vapor cartridge. Increased protection is obtained from full facepiece powered-air purifying respirators.
- If while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Acetic Acid**, or if while wearing particulate filters abnormal resistance to breathing is experienced, or eye irritation occurs while wearing a full facepiece respirator, leave the area immediately. 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 exists for exposure over **100 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.

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).

- **Acetic Acid** is a COMBUSTIBLE LIQUID.
- Use dry chemical, CO_2, water spray, alcohol-resistant foam or other foaming agents.
- POISONOUS GASES ARE PRODUCED IN FIRE.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to keep fire-exposed containers cool and disperse vapors.
- Vapor is heavier than air and may explode if ignited in an enclosed space.

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 **Acetic Acid** 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.
- Use water spray to disperse vapors.
- It may be necessary to contain and dispose of **Acetic Acid** 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 **Acetic Acid** you should be trained on its proper handling and storage.

- **Acetic Acid** reacts violently with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).
- **Acetic Acid** attacks many METALS forming flammable and explosive *Hydrogen gas*.
- **Acetic Acid** is incompatible with CHROMIC ACID; SODIUM PEROXIDE; NITRIC ACID; ACETONE; and AMMONIUM NITRATE.
- Store in tightly closed containers in a cool, well-ventilated area away from HEAT and MOISTURE.
- Sources of ignition, such as smoking and open flames, are prohibited where **Acetic Acid** is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

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.

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/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.

NJ Health
New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **ACETIC ACID**

Synonyms: Glacial Acetic Acid; Ethanoic Acid; Ethylic Acid
CAS No: 64-19-7
Molecular Formula: CH_3COOH or $C_2H_4O_2$
RTK Substance No: 0004
Description: Colorless liquid with vinegar odor

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
3 - Health **2 - Fire** **0 - Reactivity** **DOT#:** UN 2789 **ERG Guide #:** 132 **Hazard Class:** 8 (Corrosive)	Use dry chemical, CO_2, water spray, alcohol-resistant foam or other foaming agent. POISONOUS GASES ARE PRODUCED IN FIRE. CONTAINERS MAY EXPLODE IN FIRE. Use water spray to cool containers and disperse vapors. Vapor is heavier than air and may explode if ignited in an enclosed space.	Reacts violently with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE). **Acetic Acid** attacks many METALS forming flammable and explosive *Hydrogen gas*. Incompatible with CHROMIC ACID; SODIUM PEROXIDE; NITRIC ACID; ACETONE; and AMMONIUM NITRATE.

SPILL/LEAKS

Isolation Distance: 50 to 100 meters (160 to 330 feet)

Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
Use water spray to disperse vapors.
Soda Ash (Sodium Carbonate) can be used to neutralize spills.
This substance is harmful to aquatic organisms.

PHYSICAL PROPERTIES

Odor Threshold:	0.48 to 1.0 ppm
Flash Point:	103°F (39°C)
LEL:	4%
UEL:	19.99%
Vapor Density:	2.1 (air = 1)
Vapor Pressure:	15 mm Hg at 77°F (25°C)
Water Solubility:	Soluble
Boiling Point:	244°F (118°C)
Ionization Potential:	10.66 eV

EXPOSURE LIMITS

OSHA:	10 ppm 8-hr TWA
NIOSH:	10 ppm 10-hr TWA, 15 ppm STEL
ACGIH:	10 ppm 10-hr TWA, 15 ppm STEL
ERPG-1:	5 ppm
ERPG-2:	35 ppm
ERPG-3:	250 ppm

PROTECTIVE EQUIPMENT

Gloves:	Neoprene, Butyl Rubber
Coverall:	DuPont Tychem® CPF4, Responder®, TK, Reflector®; CHEMFAB Challenger® 4000.
Boot:	Neoprene or Butyl
Respirator:	>10 ppm - air purifying respirator with organic vapor cartridges, >100 ppm - supplied air

HEALTH EFFECTS

Eyes:	Irritation, burns, possible eye damage
Skin:	Irritation, burns
Acute:	Nose, throat and lung irritation, pulmonary edema, coughing, shortness of breath
Chronic:	Bronchitis, thickening and cracking of the skin

FIRST AID AND DECONTAMINATION

Remove the person from exposure.
Flush eyes with large amounts of water for at least 30 minutes. Remove contact lenses if worn. Immediate medical attention is necessary.
Remove contaminated clothing and wash contaminated skin with soap and water.
Begin artificial respiration if breathing has stopped and CPR if necessary.
Medical observation is recommended for 24 to 48 hours as symptoms may be delayed.