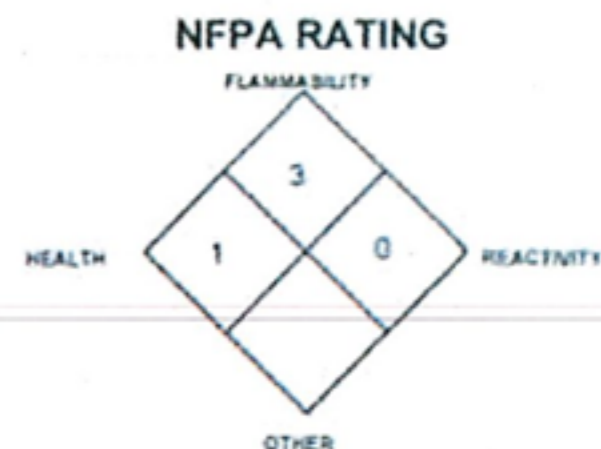


**Airgas****MATERIAL SAFETY DATA SHEET**

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

**PART I** *What is the material and what do I need to know in an emergency?***1. PRODUCT IDENTIFICATION**CHEMICAL NAME; CLASS:**ACETONE - C<sub>3</sub>H<sub>6</sub>O**

Document Number: 001088

PRODUCT USE:

General Chemical Use; Solvent

SUPPLIER:

AIRGAS INC.

ADDRESS:259 N. Radnor-Chester Road  
Suite 100  
Radnor, PA 19087-5283BUSINESS PHONE:

1-610-687-5253

EMERGENCY PHONE:

CHEMTREC: 1-800-424-9300

International: 703-527-3887 (Call Collect)

DATE OF PREPARATION:

June 15, 1999

**2. COMPOSITION and INFORMATION ON INGREDIENTS**

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		IDLH ppm	OTHER ppm
			TWA ppm	STEL ppm	TWA ppm	STEL ppm		
Acetone	67-64-1	100%	500, A4 (Not Classifiable as Human Carcinogen)	750, A4 (Not Classifiable as Human Carcinogen)	1000 750 (Vacated 1989 PEL)	1000 (Vacated 1989 PEL)	2500 (Based on 10% LEL)	NIOSH RELs: TWA = 250 DFG MAKs: TWA = 500 PEAK = 2 MAK 5 min., momentary value CARCINOGEN: EPA-D, MAK-B

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format.

### 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** Acetone is a clear, colorless, mobile, flammable liquid with a fragrant fruity or mink-like odor. Inhalation of Acetone's vapors can irritate the upper respiratory system and cause central nervous system depression (producing symptoms such as headaches, drowsiness, and confusion). Inhalation of high concentrations of the vapors may be fatal if cardio-respiratory failure occurs. Direct skin or eye contact may be irritating. Vapors of Acetone may spread long distances; distant ignition and flashback are possible. Acetone is not reactive. Emergency responders must wear the proper personal protective equipment (and have appropriate fire-suppression equipment) suitable for the situation to which they are responding.

**SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:** The most significant routes of occupational overexposure are by inhalation, skin and eye contact. The symptoms of overexposure to Acetone are as follows:

**INHALATION:** Inhalation of Acetone vapors will cause central nervous system depression. The symptoms of such exposure can include headaches, nausea, dizziness, drowsiness, confusion, slurred speech, nausea, vomiting and unconsciousness. Because Acetone is metabolized slowly, effects can be delayed. Irritation of the nose, throat, and other tissues of the upper respiratory system may also occur. Severe inhalation overexposures can result in anesthesia (loss of feeling), cardiac effects including tachycardia and hypotension, as well as serious respiratory depression, leading to cardiovascular and respiratory collapse, coma and death. Chronic inhalation exposure can result in inflammation of airways, stomach and duodenum, as well as dizziness and loss of strength. Chronic inhalation exposure can also lead to liver damage.

**CONTACT WITH SKIN or EYES:** Contact of the liquid with the eyes may cause redness and pain. Direct contact with the skin (especially after prolonged overexposure) can cause irritation. Prolonged or repeated skin overexposures can cause dermatitis.

**SKIN ABSORPTION:** Skin absorption is a potential route of overexposure for Acetone, but is not considered a serious route of exposure.

**INGESTION:** Ingestion of Acetone can cause irritation of the throat, esophagus, and stomach. Ingestion of large quantities will cause central nervous system depression and effects described under "Inhalation".

**INJECTION:** Injection is not anticipated to be a significant route of overexposure for Acetone. If Acetone is "injected" (as may occur through punctures by contaminated, sharp objects), local swelling and irritation can occur. Depending on the degree of injection overexposure, symptoms described under "Inhalation" may develop.



**OTHER HEALTH EFFECTS:** Exposure to Acetone may enhance liver toxicity of chlorinated solvents, such as 1,1-dichloroethylene and 1,1,2-trichloroethane.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.**

**ACUTE:** Inhalation of Acetone vapors can irritate the upper respiratory system and cause central nervous system depression (producing symptoms such as headaches, drowsiness, and confusion). Serious acute Inhalation, or ingestion of Acetone may cause severe depression of respiratory and cardiovascular systems. Inhalation of high concentrations of the vapors or ingestion may be fatal. Symptoms can be delayed. Direct skin or eye contact may be irritating.

**CHRONIC:** Prolonged or repeated skin overexposures can cause dermatitis. Chronic inhalation of Acetone vapors can cause liver damage, inflammation of respiratory system and muscle weakness. Refer to Section 11 (Toxicology Information) for additional information.

**TARGET ORGANS:** Acute: Skin, eyes, central nervous system, cardiovascular system. Chronic: Skin, respiratory system, liver.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	3
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			C
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

**See Section 16 for Definition of Ratings**

## PART II What should I do if a hazardous situation occurs?

### 4. FIRST-AID MEASURES

**SKIN EXPOSURE:** If Acetone contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention if any adverse reaction occurs.

**EYE EXPOSURE:** If Acetone liquid or vapors enter the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

**INHALATION:** If vapors, mists, or sprays of Acetone are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

**INGESTION:** If Acetone is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with victim.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic respiratory conditions, central nervous system conditions, eye disorders, or skin problems may be aggravated by overexposure to Acetone.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate exposure. If necessary, administer liver function tests, and eye and vision exams. The following treatment is suggested for various alcohols, and is given as symptoms of Acetone poisoning resembles that of ethyl alcohol:

- Gastric lavage with 3-5% sodium bicarbonate, unless more than 2 hours have elapsed since ingestion occurred. Do not use apomorphine. Syrup of ipecac may be a safe way to empty stomach, if given promptly after ingestion.
- Oxygen and artificial respiration as needed for hypoventilation.
- Treat for circulatory collapse, dehydration and acidosis by intravenous infusions of isotonic sodium chloride or sodium bicarbonate.
- Intravenous glucose can be administered if hypoglycemia occurs.
- Hemodialysis can be done in severe cases in which the alkali treatment may be delayed or is incomplete.
- Keep patient warm. Avoid aspiration of vomitus.

### 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** -18°C (0°F) [TCC]; -9°C (15°F) [TOC]

**AUTOIGNITION TEMPERATURE:** 465°C (869°F)

**FLAMMABLE LIMITS (in air by volume, %):**

Lower (LEL): 2.6%

Upper (UEL): 12.8%

**FIRE EXTINGUISHING MATERIALS:**

Water Spray: YES

Carbon Dioxide: YES

Foam: YES

Dry Chemical: YES

Halon: YES

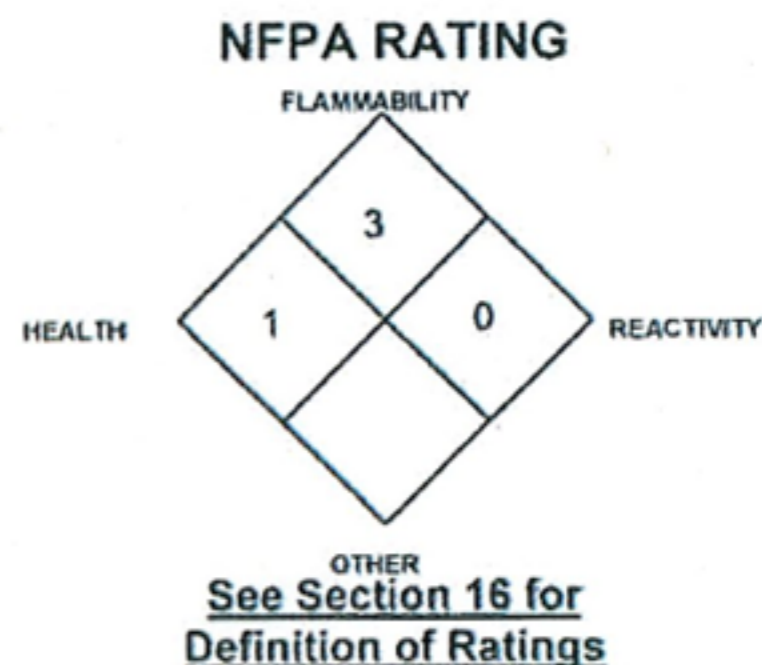
Other: Any "B" Class.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This is a Class IB flammable liquid. When involved in a fire, this material will ignite and produce toxic gases (including carbon monoxide and carbon dioxide). The vapors of Acetone may spread long distances. Distant ignition and flash-back are possible.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Static discharge may cause Acetone to ignite.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained fire-fighters to disperse Acetone's vapors and to protect personnel. If this liquid is involved in a fire, fire runoff water should be contained to prevent possible environmental damage. If necessary, decontaminate fire-response equipment with soap and water solution.



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## 6. ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK RESPONSE:** Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Eliminate all sources of ignition before clean-up begins. Use non-sparking tools. There is a colorimetric tube available for Acetone. There is a colorimetric tube available for Acetone. If a colorimetric tube is used during spill response, the reading must not be above background levels before non-emergency personnel are allowed into the release area. The atmosphere must have levels of Acetone lower than those listed in Section 2, (Composition and Information on Ingredients) and at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA).

For small spills, absorb spilled liquid with polypads or other suitable absorbent materials, wearing gloves, goggles and apron. In the event of a non-incident release, minimum Personal Protective Equipment should be **Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus.** Monitor area for combustible vapor levels. The level of vapors must be below 10% of the LEL (LEL = 2.6%), before personnel are allowed into the spill area. Absorb spilled liquid with activated carbon, polypads, or other suitable absorbent materials. Decontaminate the area thoroughly. Prevent material from entering sewer or confined spaces. Place all spill residue in a double plastic bag and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate Canadian standards (see Section 13, Disposal Considerations).

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## **PART III** *How can I prevent hazardous situations from occurring?*

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### 7. HANDLING and STORAGE

**WORK AND HYGIENE PRACTICES:** As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

**STORAGE AND HANDLING PRACTICES:** All employees who handle this material should be trained to handle it safely. Keep away from heat, sparks, and other sources of ignition. Keep container tightly closed when not in use. Use non-sparking tools. Bond and ground containers during transfers of material. If this product is transferred into another container, only use portable containers and dispensing equipment (faucet, pump, drip can) approved for flammable liquids.

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Containers should be separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Refer to NFPA 30, *Flammable and Combustible Liquids Code*, for additional information on storage.

Empty containers may contain residual liquid or vapors which are flammable; therefore, empty containers should be handled with care. Never perform any welding, cutting, soldering, drilling, or other hot work on an empty container or piping until all liquid, vapors, and residue have been cleared.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures and appropriate Canadian standards.

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### 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation. Use a mechanical fan or vent area to outside. Where appropriate, use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Ensure eyewash/safety shower stations are available near areas where Acetone is used.

**RESPIRATORY PROTECTION:** Maintain airborne contaminant concentrations below exposure limits listed in Section 2 (Composition and Information on Ingredients), if applicable. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

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## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

**RESPIRATORY PROTECTION (continued):** For additional information, the following NIOSH recommendations for respiratory protection are provided for Acetone.

### **CONCENTRATION**

Up to 2500 ppm:

### **RESPIRATORY EQUIPMENT**

Chemical cartridge respirator with organic vapor cartridge, or powered air-purifying respirator with organic vapor cartridge(s), or gas mask with organic vapor canister, or Supplied Air Respirator (SAR), or full-facepiece Self-Contained Breathing Apparatus (SCBA).

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full facepiece SCBA or positive pressure, full facepiece SAR with an auxiliary positive pressure SCBA.

Escape:

Gas mask with organic vapor canister, or escape-type SCBA should be used.

The IDLH concentration for Acetone is 2500 ppm.

**EYE PROTECTION:** Splash goggles or safety glasses, with faceshield.

**HAND PROTECTION:** Wear butyl rubber, Teflon™, Barricade™, Chemrel™, or similar gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS.

**BODY PROTECTION:** Use body protection appropriate for task. Coveralls, chemically-resistant boots, and other body protection may be appropriate, depending on the operation in which Acetone is used.

## 9. PHYSICAL and CHEMICAL PROPERTIES

**RELATIVE VAPOR DENSITY (air = 1):** 2.0

**SPECIFIC GRAVITY (water = 1):** 0.791

**SOLUBILITY IN WATER:** Soluble.

**EVAPORATION RATE (n-BuAc = 1):** Not established.

**EXPANSION RATIO:** Not applicable.

**VAPOR PRESSURE @ 20°C:** 180 mm Hg

**LOG COEFFICIENT WATER/OIL DISTRIBUTION:** -0.24

**APPEARANCE, ODOR AND COLOR:** Acetone is a clear, colorless, mobile liquid with a fruity or mint-like odor.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The odor may be a distinctive characteristic of Acetone, if accidentally released.

**pH:** Not applicable.

**FREEZING/MELTING POINT:** -95.4°C (-139.7°F)

**BOILING POINT:** 56.2°C (133.2°F)

**ODOR THRESHOLD:** 200-400 ppm

**SPECIFIC VOLUME:** Not determined.

**MOLECULAR WEIGHT:** 58.08

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable at standard temperatures and pressures.

**DECOMPOSITION PRODUCTS:** When ignited in air, the products of thermal decomposition include carbon monoxide, carbon dioxide, and formaldehyde.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Acetone reacts violently with strong oxidizing agents, and chlorinated solvent/alkali mixtures. Acetone reacts vigorously with hexachloromelamine, sulfur dichloride and potassium *tert*-butoxide.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Contact with incompatible materials and exposure to heat, sparks and other sources of ignition.

## PART III *How can I prevent hazardous situations from occurring?*

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The following toxicology data are currently available for Acetone.

Standard Draize Test (Eye-Human) 500 ppm

Standard Draize Test (Eye effects-Rabbit, adult) 3950 : Severe irritation effects

Standard Draize Test (Eye effects-Rabbit, adult) 20 mg/24 hours Moderate irritation effects

Standard Draize Test (Skin-Rabbit, adult) 395 mg open Mild irritation effects

Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours Mild irritation effects

LD<sub>50</sub> (Oral-Rat) 5800 mg/kg

LD<sub>50</sub> (Oral-Mouse) 3000 mg/kg

LD<sub>50</sub> (Oral-Rabbit, adult) 5340 mg/kg

LD<sub>50</sub> (Skin-Rabbit, adult) 20 g/kg

LD<sub>50</sub> (Intravenous-Rat) 5500 mg/kg

LD<sub>50</sub> (Intravenous-Rat) 5500 mg/kg

LD<sub>50</sub> (Intraperitoneal-Mouse) 1297 mg/kg

LDLo (Intravenous-Mouse) 4 g/kg

LDLo (Intraperitoneal-Rat) 500 mg/kg

TDLo (Oral-Man) 2857 mg/kg

TDLo (Inhalation-Man) 440 g/m<sup>3</sup>/6 minutes

TDLo (Inhalation-Man) 10 mg/m<sup>3</sup>/6 hours

TDLo (Oral-Rat) 273 gm/kg; male 13

week(s) pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl genetic material, sperm morphology, motility, and count)

LDLo (Oral-Dog, adult) 8 g/kg

LC<sub>50</sub> (Inhalation-Rat) 50,100 mg/m<sup>3</sup>/8 hours

LCLo (Inhalation-Mouse) 110 g/m<sup>3</sup>/1 hour

TCLo (Inhalation-Human) 500 ppm: Eye effects

TCLo (Inhalation-Man) 12,000 ppm/4 hours: Central nervous system effects

TCLo (Inhalation-Man) 12,000 ppm/4 hours: Gastrointestinal tract effects

TCLo (Inhalation: Mammal-species unspecified) 31500 µg/m<sup>3</sup>/24 hours: female 1-13 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TCLo (Inhalation-Mammal) 31,500 g/m<sup>3</sup>/24 hours (1-13 days preg): Reproductive effects

## 11. TOXICOLOGICAL INFORMATION (Continued)

### TOXICITY DATA (continued):

Cytogenetic Analysis (Saccharomyces cerevisiae) 200 mmol/tube	Sex Chromosome Loss and Nondisjunction (Saccharomyces cerevisiae) 47,600 ppm	Sex chromosome loss and nondisjunction (Saccharomyces cerevisiae) 47600 ppm Cytogenetic Analysis (Hamster-Fibroblast) 40 gm/L
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**SUSPECTED CANCER AGENT:** Acetone is listed as follows:

**EPA-D** (Not Classifiable as to Human Carcinogenicity - inadequate human and animal evidence of carcinogenicity or no data available)  
**ACGIH TLV-A4** (Not Classifiable as a Human Carcinogen - agent which causes concern that it could be carcinogenic for humans, but which cannot be assumed conclusively because of lack of data.)

Acetone is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, or CAL/OSHA, and is therefore not considered to be, nor suspected to be, a cancer-causing agent by these agencies.

**IRRITANCY OF PRODUCT:** The liquid or vapors of Acetone can be irritating to contaminated tissue.

**SENSITIZATION OF PRODUCT:** Acetone is not known to cause sensitization in humans after prolonged or repeated exposures.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of Acetone on the human reproductive system.

**Mutagenicity:** Acetone is not reported to produce mutagenic effects in humans. Data are available for Acetone in microorganisms.

**Embryotoxicity:** Acetone is not reported to produce embryotoxic effects in humans.

**Teratogenicity:** Acetone is not reported to cause teratogenic effects in humans.

**Reproductive Toxicity:** Acetone is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of this compound indicate reproductive effects.

*A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.*

**BIOLOGICAL EXPOSURE INDICES:** The following Biological Exposure Indices (BEIs) are associated with Acetone:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
ACETONE Acetone in urine	End of shift	100 mg/L

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**ENVIRONMENTAL STABILITY:** Acetone will be degraded over time into other organic compounds. The following environmental data are available for Acetone:

Estimated Log  $K_{ow}$  = -0.24; Estimated Log  $K_{oc}$  = 1; Water Solubility = Miscible.

**Biodegradation:** Although Acetone is quite readily degraded in the environment, the primary removal of Acetone is through evaporation. BOD = 122%; 5 days.

**Bioconcentration:** The potential for bioconcentration in fish is negligible. One experimental study of bioconcentration in adult haddock at 7-9°C (static test) resulted in a BCF of 0.69

**Mobility/Soil Adsorption:** Acetone is expected to be very mobile in soil, based on estimated Log  $K_{ow}$  and Log  $K_{oc}$  values. Acetone has shown no adsorption to montmorillonite, kaolinite clay or stream sediment.

**Persistence:** If released to soil, Acetone is expected to volatilize (from moist soil surfaces). Acetone will be highly mobile in soil, possible leaching to groundwater. Acetone is expected to biodegrade from soils. If released to water, Acetone will not adsorb to suspended solids or sediments. Acetone is expected to volatilize from water surfaces to the atmosphere. The estimated half-lives of Acetone in a model river and model lake are 38 and 33 hours, respectively. If released to the atmosphere, Acetone will exist solely as a vapor in the atmosphere. Vapor-phase acetone is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. The half-life for this reaction in air is estimated to be 71 days. The average rate of photodissociation of Acetone by natural sunlight in the lower troposphere has been measured as  $1 \times 10^{-7}$  sec-s. This corresponds to a half-life of about 80 days.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Acetone may be harmful or fatal to contaminated plant and animal-life (especially if large quantities of Acetone are released). Refer to section 11 (Toxicological Information) for additional information on effects on animals. The following data are available for bird life:

LC<sub>50</sub> (Japanese quail) = 40,000 ppm, in diet, age 14 days, (no mortality to 40,000 ppm)

LC<sub>50</sub> (Ring-necked pheasant) = 40,000 ppm, in diet, age 10 days, (no mortality to 40,000 ppm)

## 12. ECOLOGICAL INFORMATION (Continued)

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** Acetone can be harmful or fatal to contaminated aquatic plant and animal life. The following aquatic toxicity data are available for Acetone:

TLm ( <i>Daphnia magna</i> ) 24 and 48 hours = 10 mg/L (conditions of bioassay not specified)	LC <sub>50</sub> ( <i>Gammarus pulex</i> ) = 5,500 mg/L
TLm (brine shrimp) 24 and 48 hours = 2100 mg/L. (conditions of bioassay not specified)	LC <sub>50</sub> ( <i>Pimephales promelas</i> ) 96 hours = 8,120 mg/L. (conditions of bioassay not specified)
NOEC ( <i>Daphnia magna</i> ) reproduction = 3,200 mg/L	LC <sub>50,F</sub> (fingerling trout) 24 hours = 6,100 mg/L
NOEC ( <i>Daphnia magna</i> ) growth = 1,000 mg/L	LD <sub>100</sub> ( <i>Asellus aquaticus</i> ) within 3 days = 3 mL (conditions of bioassay not specified)
LC <sub>50</sub> (mosquito fish) 24-96 hours = 13,000 mg/L	LD <sub>100</sub> ( <i>Gammarus fossarum</i> ) 48 hours = 10 mL/L. (conditions of bioassay not specified)
LC <sub>50</sub> (goldfish) 24 hours = 5,000 mg/L	EC <sub>0</sub> ( <i>Pseudomonas putida</i> bacteria) 16 hours = 1,700 mg/L
LC <sub>50</sub> ( <i>Lepomis macrochirus</i> bluegill sunfish) 96 hours = 8,300 mg/L	EC <sub>0</sub> ( <i>Microcystis aeruginosa</i> algae) 8 days = 530 mg/L
LC <sub>50</sub> ( <i>Poecilia reticulata</i> guppy) 14 days = 7,032 mg/L	EC <sub>0</sub> ( <i>Scenedesmus quadricauda</i> green algae) 7 days = 7,500 mg/L
LC <sub>50</sub> (Mexican axolotl 3-4 w after hatching) 48 hours = 20,000 mg/L	EC <sub>0</sub> ( <i>Entosiphon sulcatum</i> protozoa) 72 hours = 28 mg/L
LC <sub>50</sub> (clawed toad 3-4 w after hatching) 48 hours = 24,000 mg/L	EC <sub>0</sub> ( <i>Uronema parduczi</i> Chatton-Lwoff protozoa) = 1,710 mg/L
LC <sub>50</sub> ( <i>Daphnia magna</i> ) growth = 17,100 mg/L	EC <sub>50</sub> ( <i>Daphnia magna</i> ) reproduction = 4,000 mg/L
LC <sub>50</sub> ( <i>Salmo gairdneri</i> , rainbow trout) 86 hours = 5,540 mg/L @ 12°C; (95% confidence limit 4,740-6,330 mg/L), wt 1.0 g (static bioassay)	

## 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL:** Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Do not dispose of locally.

**U.S. EPA WASTE NUMBER:** D001 (Characteristic, Ignitability), applicable to wastes consisting only of this compound.

## 14. TRANSPORTATION INFORMATION

**THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.**

**PROPER SHIPPING NAME:** Acetone  
**HAZARD CLASS NUMBER and DESCRIPTION:** 3 (Flammable Liquid)  
**UN IDENTIFICATION NUMBER:** UN 1090  
**PACKING GROUP:** PG II  
**DOT LABEL(S) REQUIRED:** Flammable Liquid  
**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):** 127  
**MARINE POLLUTANT:** Acetone is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

**TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the following information for the preparation of Canadian Shipments.

## 15. REGULATORY INFORMATION

### ADDITIONAL U.S. REGULATIONS:

**U.S. SARA REPORTING REQUIREMENTS:** Acetone is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Acetone	NO	YES	NO

**U.S. SARA THRESHOLD PLANNING QUANTITY:** There are no specific Threshold Planning Quantities for Acetone. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

**U.S. CERCLA REPORTABLE QUANTITIES (RQ):** 5000 lb. (2270 kg)

**U.S. TSCA INVENTORY STATUS:** Acetone is listed on the TSCA Inventory.

**OTHER U.S. FEDERAL REGULATIONS:** Depending on specific operations involving the use of Acetone, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation, Acetone is not listed in Appendix A; however, any process that involves a flammable liquid on-site, in one location, in quantities of 10,000 lb (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

## 15. REGULATORY INFORMATION (Continued)

U.S. STATE REGULATORY INFORMATION: Acetone is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Acetone.	Massachusetts - Substance List: Acetone.	Pennsylvania - Hazardous Substance List: Acetone.
California - Permissible Exposure Limits: Acetone.	Michigan - Critical Materials Register: No.	Rhode Island - Hazardous Substance List: Acetone.
Florida - Substance List: Acetone.	Missouri - Employer Information/Toxic Substance List: Acetone.	Texas - Hazardous Substance List: Acetone.
Illinois - Toxic Substance List: Acetone.	New Jersey - Right to Know Hazardous Substance List: Acetone.	West Virginia - Hazardous Substance List: Acetone.
Kansas - Section 302/313 List: Acetone.	North Dakota - List of Hazardous Chemicals, Reportable Quantities: Acetone.	Wisconsin - Toxic and Hazardous Substances: Acetone.
Minnesota - List of Hazardous Substances: Acetone.		

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Acetone is not on the California Proposition 65 List.

LABELING: WARNING! FLAMMABLE LIQUID AND VAPOR. PROLONGED OR REPEATED SKIN CONTACT MAY DRY SKIN AND CAUSE IRRITATION. HARMFUL OR FATAL IF SWALLOWED. CAN CAUSE CENTRAL NERVOUS SYSTEM EFFECTS OR LIVER DAMAGE. CAN CAUSE DEATH IF TOO MUCH VAPOR IS BREATHED. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Avoid contact with skin and clothing. Avoid exposure to vapor. Wash thoroughly after handling. FIRST-AID: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, foam, dry chemical, or CO<sub>2</sub>. IN CASE OF SPILL: Absorb spill with inert materials (e.g. activated carbon, dry sand). Flush residual spill with water. Consult Material Safety Data Sheet for additional information.

ADDITIONAL CANADIAN REGULATIONS:

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: Acetone is not on the CEPA Priorities Substances Lists.

CANADIAN DSL/NDL INVENTORY STATUS: Acetone is listed on the Canadian DSL Inventory.

CANADIAN WHMIS SYMBOLS: Class B2: Flammable Liquid  
Class D2B: Materials Causing Other Toxic Effects



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## 16. OTHER INFORMATION

**PREPARED BY:**

CHEMICAL SAFETY ASSOCIATES, Inc.  
9163 Chesapeake Drive, San Diego, CA 92123-1002  
619/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

## DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

**CAS #:** This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

### EXPOSURE LIMITS IN AIR:

**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

**TLV - Threshold Limit Value** - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour **Time Weighted Average (TWA)**, the 15-minute **Short Term Exposure Limit**, and the instantaneous **Ceiling Level**. Skin absorption effects must also be considered.

**OSHA** - U.S. Occupational Safety and Health Administration.

**PEL - Permissible Exposure Limit** - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

**IDLH - Immediately Dangerous to Life and Health** - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

**The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

### HAZARD RATINGS:

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:** Health Hazard: 0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

**NATIONAL FIRE PROTECTION ASSOCIATION:** Health Hazard: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can, on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

### FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **National Fire Protection Association (NFPA)**. Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

### TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD<sub>50</sub>** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC<sub>50</sub>** - Lethal Concentration (gases) which kills 50% of the exposed animals, ppm concentration expressed in parts of material per million parts of air or water; **mg/m<sup>3</sup>** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program; **RTECS** - the Registry of Toxic Effects of Chemical Substances; **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo**, the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause death. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

### REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. **Superfund Amendments and Reauthorization Act (SARA)**; the **Canadian Domestic Substances List (DSL)**; the U.S. **Toxic Substances Control Act (TSCA)**; Marine Pollutant status according to the DOT; California's Safe Drinking Water Act (**Proposition 65**); the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the materials package label.