

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Acetone**
 Synonyms: 2-Propanone

Product Code: Acetone
 CAS Number: 67-64-1

Company Identification: **NuGeneration Technologies, LLC**
 1155 Park Ave.
 Emeryville, CA 94608

www.nugentec.com/biotech

1-888-996-8436 (For product information) 1-800-424-9300 (For emergencies - CHEMTREC)

2. COMPOSITION / INFORMATION ON INGREDIENTS

CONTAINING: HAZARDOUS AND/OR REGULATED COMPONENTS

<u>Chemical Name</u>	<u>Amount</u>	<u>CAS Number</u>	<u>Hazardous</u>	<u>OSHA PEL (ppm)</u>	<u>ACGIH TLV (ppm)</u>
Acetone	100%	67-64-1	YES	1000	500

COMPOSITION COMMENT: --

***California Prop 65:** This product does contain an ingredient(s), above the safe harbor limits, which are known to the state of California to cause cancer, birth defects, or other reproductive harm.

HAZARDS DISCLOSURE: This product contains known hazardous materials in reportable levels as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200 except as listed above. As defined under Sara 311 and 312, this product contains known hazardous materials.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR.
 HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.
 CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
 AFFECTS CENTRAL NERVOUS SYSTEM.



Hazardous Material Information System (HMIS):	Health	1
	Flammability	3
	Reactivity	0
	Personal Protection	C

National Fire Protection Association (NFPA):

NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

Protective Equipment: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER.

POTENTIAL HEALTH EFFECTS**ROUTES OF ENTRY:** Skin contact. Eye contact. Inhalation. Ingestion.**TARGET ORGANS:** respiratory system, central nervous system (CNS), skin.

INHALATION: The vapor is discomforting to the upper respiratory tract. Inhalation hazard is increased at higher temperatures. Exposure to ketone vapors may produce nose, throat and mucous membrane irritation. High concentrations of vapor may produce central nervous system depression characterized by headache, vertigo, loss of coordination, narcosis and cardiorespiratory failure. Some ketones produce neurological disorders (polyneuropathy) characterized by bilateral symmetrical paresthesia and muscle weakness primarily in the legs and arms. Symptoms of exposure may include restlessness, headache, vomiting, stupor, low blood pressure and rapid and irregular pulse, eye and throat irritation, weakness of the legs, dizziness and lightheadedness. Inhalation of high concentrations produces dryness of the mouth and throat, dizziness, nausea, incoordinated movements, loss of coordinated speech, drowsiness, and in extreme cases, coma. Inhalation of acetone vapors over long periods causes irritation of the respiratory tract, coughing, headache. Acetone concentrations of 52200 ppm for 1 hour produced narcosis in rats and fatalities at 126600 ppm.

INGESTION: Considered an unlikely route of entry in commercial/industrial environments. The liquid is highly discomforting and mildly toxic if swallowed but may be harmful if swallowed in quantity. Small amounts or low dose rates are regarded as practically non-harmful.

SKIN CONTACT: May cause irritation, redness, and pain. May be absorbed through skin with symptoms similar to those from inhalation. Toxic effects may result from skin absorption. Symptoms for skin absorption are the same as for inhalation. Bare unprotected skin should not be exposed to this material.

EYE CONTACT: The liquid may produce eye discomfort and is capable of causing temporary impairment of vision and/or transient eye inflammation, ulceration. The vapor is discomforting to the eyes. Repeated or prolonged exposure to irritants may produce conjunctivitis.

CHRONIC EXPOSURE: Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following. Workers exposed to 700 ppm acetone for 3 hours/day for 7-15 years showed inflammation of the respiratory tract, stomach and duodenum, attacks of giddiness and loss of strength. Exposure to acetone may enhance liver toxicity of chlorinated solvents.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane. Persons with skin disorders, or impaired liver, or pulmonary function may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

INHALATION FIRST AID: If a respiratory problem develops from vapors. Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

SKIN CONTACT FIRST AID: Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

EYE CONTACT FIRST AID: If contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

INGESTION FIRST AID: Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

STATEMENT OF PRACTICAL TREATMENT: Always have plenty of water available for first aid. Get medical attention if any symptoms develop or persist.

For acute or short-term repeated exposures to acetone:

1. Symptoms of acetone exposure approximate ethanol intoxication.
2. About 20% is expired by the lungs and the rest is metabolized. Alveolar air half-life is about 4 hours following two hour inhalation at levels near the Exposure Standard; in overdose, saturable metabolism and limited clearance, prolong the elimination half-life to 25-30 hours.
3. There are no known antidotes and treatment should involve the usual methods of decontamination followed by supportive care.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: FLAMMABLE!

AUTO IGNITION TEMPERATURE: 465 °C (869 °F)

FLASH POINT: Flash point: -20C (-4F) CC

FLAMMABLE LIMITS IN AIR, % by Volume: lel: 2.5; uel: 12.8

EXTINGUISHING MEDIA: Carbon dioxide, alcohol foam, dry chemical extinguishers. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors. PLEASE NOTE: 10% of acetone in water has a flash point below 20 deg. °C (68 °F).

FIRE & EXPLOSION HAZARDS: Above the flash point, explosive vapor-air mixtures may be formed.

Flammable vapors that are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flashback along vapor trail may occur. May be detonated if confined and heated, or by shock from high explosives. Becomes more sensitive to detonation by contamination with certain chemical compounds, such as amines and acids. Fire and explosion hazard when under pressure. Sensitive to static discharge.

SPECIAL INFORMATION:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Do not approach containers suspected to be hot.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. Follow applicable OSHA regulations (29 CFR 1910.120).

7. HANDLING AND STORAGE

RECOMMENDED STORAGE CONDITIONS: Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Protect storage area from exposure to external fires. After this container has been emptied, it may contain explosive vapors; observe all warnings and precautions listed for the product. Do not cut, or weld on or near this container. Protect storage area and processing vessels from high energy projectiles by a suitable barricade. Separate from flammables and sensitizers. Do not reuse or dispose of empty containers until they have been rinsed with water. DO NOT enter confined spaces until atmosphere has been checked.

SHELF LIFE: See Label on packaging.

HANDLING (PERSONNEL): Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, bare lights, heat or ignition sources. When handling, DO NOT eat, drink or smoke. Vapor may ignite on pumping or pouring due to static electricity. DO NOT use plastic buckets. Ground and secure metal containers when dispensing or pouring product. Use spark-free tools when handling. Avoid contact with incompatible materials. Keep containers securely sealed. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practices. Observe manufacturer's storing and handling recommendations. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS: See Section 2 above.

Acetone:

- OSHA Permissible Exposure Limit (PEL): 1000 ppm (TWA)
- ACGIH Threshold Limit Value (TLV): 500 ppm (TWA), 750 ppm (STEL) A4 - not classifiable as a human carcinogen

VENTILATION SYSTEM: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

PERSONAL RESPIRATORS (NIOSH APPROVED): If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airtight hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

RESPIRATORY PROTECTION:

Exposure Range >1000 to <2500 ppm: Supplied Air, Constant Flow/Pressure Demand, Full Face

Exposure Range 2500 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face

Note: use ov (black) cartridge for nuisance(<1000)

SKIN PROTECTION: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Barrier cream with polyethylene gloves or Butyl rubber gloves or Neoprene rubber gloves. Safety footwear. Butyl and Neoprene Gloves for best protection. Avoid PVC and rubber gloves.

EYE PROTECTION: Use chemical safety goggles and/or a full face shield where splashing is possible.

Maintain eye wash fountain and quick-drench facilities in work area. Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Clear, colorless, volatile liquid.

COLOR: Clear / colorless

ODOR: Pungent - ketone

BOILING POINT: 56°C (133°F) @ 760 mm Hg

SOLUBILITY IN WATER: miscible

SPECIFIC GRAVITY: 0.79 at 20 °C (Water =1)

MELTING/FREEZING POINT: -94°C (-138°F)

Evaporation Rate (BuAc=1): 6.06

AUTO IGNITION TEMPERATURE: 465C (869F)

FLASH POINT: -20C (-4F) CC

pH: N/A

VAPOR PRESSURE: N/D @ 20C (68F) @ 72°F

% VOLATILES BY VOLUME @ 21C (70F): 100

VAPOR DENSITY: 2 (air = 1)

Molecular weight: 58.09

Molecular Formula: C₃H₆O

10. STABILITY AND REACTIVITY

STABILITY: Product is considered stable.

CONDITIONS TO AVOID: Heat, flames, ignition sources and incompatibles.

POLYMERIZATION: Hazardous polymerization will not occur.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid storage with oxidizers, strong acids and strong alkalis. Reacts violently with bromoform and chloroform in the presence of alkalis or in contact with alkaline surfaces.

DECOMPOSITION: Burning may produce carbon monoxide, carbon dioxide, chlorinated gases.

11. TOXICOLOGICAL INFORMATION**Toxicological Data:**

Acetone - Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m³; Irritation eye rabbit, Standard Draize, 20 mg severe; investigated as a tumorigen, mutagen, reproductive effector.

Inhalation (human) TCl_o: 500 ppm

Carcinogenicity:

Carcinogenic effects: A4 (Not classifiable for humans or animals.) by ACGIH.

Mutagenic effects: Not available.

Teratogenic effects: Not available.

Cancer Lists

---NTP Carcinogen---

Ingredient**Known****Anticipated****IARC Category**

Acetone (67-64-1)

No

No

None

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE: When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is not expected to biodegrade. When released into water, this material may evaporate to a moderate extent. When released into water, this material is expected to have a half-life between 10 and 30 days. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material has a log octanol-water partition coefficient of less than 4.0. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by photolysis. When released into the air, this material is expected to have a half-life of less than 1 day.

ENVIRONMENTAL TOXICITY: LD100 *Asellus aquaticus* 3 ml/l (within 3 days of exposure) /Conditions of bioassay not specified; LC50 Mexican axolotl 20.0 mg/l/48 hr (3-4 weeks after hatching) /Conditions of bioassay not specified; TLm Mosquito fish 13,000 mg/l/24, 48, 96 hr /Conditions of bioassay not specified; LD100 *Gammarus fossarum* 10 ml/l (within 48 hr) /Conditions of bioassay not specified; LC50 *Poecilia reticulata* (guppy) 7,032 ppm/14 days /Conditions of bioassay not specified; LC50 Ring-necked pheasant oral greater than 40,000 ppm, in diet, age 10 days, (no mortality to 40,000 ppm); LC50 *Salmo gairdneri* (Rainbow trout) 5,540 mg/l/96 hr at 12 °C (95% confidence limit 4,740-6,330 mg/l), wt 1.0 g /static bioassay; LC50 Clawed toad 24.0 mg/l/48 hr (3-4 weeks after hatching) /Conditions of bioassay not specified; TLm *Daphnia magna* 10 mg/l/24, 48 hr /Conditions of bioassay not specified.

Henry's Law Constant: 3.97 x10⁻⁵

BCF: negligible

Biochemical Oxygen Demand (BOD): theoretical 122%, 5 days

Octanol/Water Partition Coefficient: log K_{ow} = -0.24

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Whatever cannot be saved for recovery or recycling should be handled as a non hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of material in accordance with federal, state and local requirements.

CONTAMINATED MATERIALS: Wash contaminated clothing before reuse.

14. TRANSPORTATION INFORMATION

Domestic (Land, D.O.T.), International (Water, I.M.O.), International (Air, I.C.A.O.)

CLASS: 3 – Flammable Liquid
 PRODUCT LABEL: Acetone
 UN NUMBER: 1090
 PACKING GROUP: II – Medium Danger
 D.O.T. SHIPPING NAME: ACETONE - Flammable Liquids, N.O.S.
 PRODUCT RQ (LBS): 5,000 lbs (2268 kg)
 ERG Guide Number: 127
 SUPPLEMENTAL HAZARD: N/A
 SPECIAL PROVISIONS: IB2, T4, TP1
 Packaging: Exceptions: 150 Non-bulk: 202 Bulk: 242
 Quantity Limitations: Passenger aircraft: 1 L Cargo aircraft only: 60 L
 Vessel Stowage: Location: B



15. REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

Chemical Inventory Status - Part 1

Ingredient	<u>TSCA</u>	<u>EC</u>	<u>Japan</u>	<u>Australia</u>
Acetone	YES	YES	YES	YES

Chemical Inventory Status - Part 2

Ingredient	<u>Korea</u>	<u>DSL</u>	<u>CANADA</u> <u>NDSL</u>	<u>Phil.</u>
Acetone	YES	YES	NO	YES

Federal, State & International Regulations - Part 1

	<u>-SARA 302-</u>		<u>-SARA 313-</u>	
Ingredient	<u>RQ</u>	<u>TPQ</u>	<u>List</u>	<u>Chemical Catalog</u>
Acetone	NO	NO	YES	NO

Federal, State & International Regulations - Part 2

	<u>CERCLA</u>	<u>-RCRA-</u>	<u>-TSCA-</u>
Ingredient		<u>261.33</u>	<u>8(d)</u>
Acetone	5000	U002	NO

Chemical Weapons Convention: No **TSCA 12(b):** No **CDTA:** Yes

Clean Water Act (CWA) 307: No products were found.
 Clean Water Act (CWA) 311: No products were found.
 Clean Air Act (CAA) 112 accidental release prevention: No products were found.
 Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
 Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: No (Pure / Liquid)



MATERIAL SAFETY DATA SHEET

Acetone

Last Updated March 15, 2011

STATE REGULATIONS:

Pennsylvania RTK: Acetone: (environmental hazard, generic environmental hazard)

Massachusetts RTK: Acetone

New Jersey: Acetone

PROP 65 - WARNING: NONE

THIS PRODUCT DOES NOT CONTAIN A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

RCRA 40 CFR: Listed U210 Toxic Waste and Listed U002 Ignitable Waste.

Australian Hazchem Code: 2[Y]E

Poison Schedule: None allocated.

WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

This material or all of its components are listed on the Inventory of Existing Chemical Substances under the Toxic Substance Control Act (TSCA). This material or all of its components are listed on the Canadian Domestic Substances List (DSL). This material or all of its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical Substances (EINECS). Other inventory lists: Korea (TCCL), Australia (AICS), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

16. OTHER INFORMATION

**Label Requirements: EXTREMELY FLAMMABLE LIQUID AND VAPOR.
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, SKIN,
CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
VAPOR MAY CAUSE FLASH FIRE.**

Prepared By: Donato Polignone

Part Number: Acetone

Approved By: NuGeneration Technologies, LLC, Environmental Health and Safety Department

Approval Date: March 15, 2011

Supersedes Date: October 20, 2009

ADDITIONAL INFORMATION:

The data in this Material Safety Data Sheet relates only to the specific material designated herein. It does not relate to use in combination with any other material or in any process. This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-2004) and GHS Standards.

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of NuGeneration Technologies, LLC. The data on this sheet are related only to the specific material designated herein. NuGeneration Technologies, LLC assumes no legal responsibility for use or reliance upon these data.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

END OF MSDS