

**Part Number:** Anhydrous BP80, BP88, BP92, USP, FCC, Technical **Chemical Name:** Citric Acid, Anhydrous **Product Use:** For Manufacturing Use **Synonyms:** 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; 2-Hydroxy-1,2,3-propanetricarboxylic acid; Propane-1,2,3-tricarboxylic acid, 2-hydroxy-; beta-hydroxytricarballic acid.

**Supplier Information**

Chem One Ltd. Phone: (713) 896-9966 8017 Pinemont Drive, Suite 100 Fax: (713) 896-7540 Houston, Texas 77040-6519 Emergency # (800) 424-9300 or (703) 527-3887

**General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.**

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

**\*\*\* Section 2 - Composition / Information on Ingredients \*\*\***

CAS #	Component	Percent
77-92-9	Citric Acid	> 99%

**Component Information/Information on Non-Hazardous Components**

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

**\*\*\* Section 3 - Hazards Identification \*\*\***

**Emergency Overview** Citric Acid is a white or colorless crystalline solid. Citric Acid is irritating to eyes, skin, and respiratory tract. Citric Acid poses a slight fire potential when heated, and is combustible in liquid form. In addition, aqueous solutions of Citric Acid can, if in contact with reactive metals (e.g. iron, zinc, aluminum) form flammable hydrogen which may result in an explosive air mixture. Large amounts or airborne dusts of Citric Acid can present an air/dust explosion hazard. Use methods suitable for surrounding fire. Firefighters should wear full protective equipment when fighting a fire involving this product.

**Hazard Statements** WARNING! CITRIC ACID CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not breath mists or dusts. Do not allow contact with eyes, skin, or clothing. Keep container closed. Avoid generation of dusts, which can result in a dust explosion. Use only with adequate ventilation. Wash thoroughly after handling.

**Potential Health Effects: Eyes** Dusts and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations.

**Potential Health Effects: Skin** This product may cause moderate irritation of the skin. Citric Acid may cause allergic contact dermatitis with prolonged or repeated contact.

**Potential Health Effects: Ingestion** Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, and abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Chronic ingestion of high concentration Citric Acid can result in erosion of tooth enamel.

**Potential Health Effects: Inhalation**

Dusts and mists from solutions may cause mild to moderate irritation of the nose and throat. Overexposure could cause coughing, sneezing, and labored breathing.

**HMIS Ratings: Health Hazard: 2\* Fire Hazard: 1 Physical Hazard: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe \* = Chronic hazard

**First Aid: Eyes** Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

**First Aid: Skin** Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

**First Aid: Ingestion** DO NOT INDUCE VOMITING, unless directed by medical personnel.

Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

**First Aid: Inhalation** Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

**First Aid: Notes to Physician**

There is no specific antidote. Care is symptomatic and supportive.

**\*\*\* Section 5 - Fire Fighting Measures \*\*\***

**Flash Point:** 99.9 °C (212 deg F) **Method Used:** Not applicable.

**Upper Flammable Limit (UEL):** 2.29 kg/m<sup>3</sup> (dust) **Lower Flammable Limit (LEL):** 0.28-2.3 kg/m<sup>3</sup> (dust)

**Auto Ignition:** 1010 deg. C (1850 deg F) [powder] **Flammability Classification:** Not applicable.

**Rate of Burning:** Not applicable.

**General Fire Hazards**

Can burn; slight fire hazard when exposed to heat or flame. Citric Acid poses a serious dust explosion hazard.

#### **Hazardous Combustion Products**

Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

#### **Extinguishing Media**

Water, foam, dry chemical, or carbon dioxide.

#### **Fire Fighting Equipment/Instructions**

Firefighters should wear full protective clothing including self contained breathing apparatus.

#### **NFPA Ratings: Health: 2 Fire: 1 Reactivity: 0 Other:**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

### **\* \* \* Section 6 - Accidental Release Measures \* \* \***

**Containment Procedures** Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

**Clean-Up Procedures** Wear appropriate protective equipment and clothing during clean-up. Addition of lime (calcium oxide) will neutralize Citric Acid and precipitate calcium citrate. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

**Evacuation Procedures** Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

**Special Procedures** Remove soiled clothing and laundry before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

**Handling Procedures** All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling. Avoid accumulation of dusts, which can lead to a serious hazard of dust explosion.

**Storage Procedures** Keep container tightly closed when not in use. 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). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Wipe down area of use periodically to avoid the accumulation of dusts.

### **\* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \***

#### **Exposure Guidelines**

##### **A: General Product Information**

No exposure guidelines have been established.

##### **B: Component Exposure Limits**

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

**The exposure limits given are for Particulates Not Otherwise Classified (PNOC).**

OSHA: 15 mg/m<sup>3</sup> TWA (Total dust)

5 mg/m<sup>3</sup> TWA (Respirable fraction)

DFG MAKs 4 mg/m<sup>3</sup> TWA (Inhalable fraction)

1.5 mg/m<sup>3</sup> TWA (Respirable fraction)

#### **Engineering Controls**

Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents.

#### **PERSONAL PROTECTIVE EQUIPMENT**

*The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.*

##### **Personal Protective Equipment: Eyes/Face**

Wear safety glasses with side shields or chemical goggles. Faceshield should be considered when working with solutions of Citric Acid.

If necessary, refer to U.S. OSHA 29 CFR 1910.133.

##### **Personal Protective Equipment: Skin**

Use impervious gloves. Butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, or PVC are recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

#### Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask. 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. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a fullfacepiece 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).

#### Personal Protective Equipment: General

Have an eyewash fountain and safety shower available in the work area. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Wash hands thoroughly after handling material. Do not eat, drink, or smoke in work areas.

#### Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for

formulation purposes.

<b>Appearance:</b>	Colorless powder.	<b>Odor:</b>	None.
<b>Physical State:</b>	Solid.	<b>pH:</b>	1.8 (5% solution); 2.1 (0.1 M solution)
<b>Vapor Pressure:</b>	Not applicable.	<b>Vapor Density:</b>	Not applicable.
<b>Boiling Point:</b>	Decomposes	<b>Freezing Point/Melting Point:</b>	153 deg. C (307.4 deg F)
<b>Solubility (H<sub>2</sub>O):</b>	59.2% at 20 deg. C	<b>Specific Gravity:</b>	1.665 @ 20 deg C
<b>Percent Volatile:</b>	0 @ 21 deg. C	<b>Particle Size:</b>	powder or crystals
<b>Softening Point:</b>	Not applicable.	<b>Evaporation Rate:</b>	Not applicable.
<b>Viscosity:</b>	Not applicable.	<b>Bulk Density:</b>	900-980 kg/m <sup>3</sup>
<b>Chemical Formula:</b>	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	<b>Molecular Weight:</b>	192.13

#### \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

##### Chemical Stability

Stable under normal conditions. Dilute aqueous solutions of Citric Acid may ferment if left standing for long period of time.

##### Chemical Stability: Conditions to Avoid

Heat, moisture and incompatible materials.

**Incompatibility** Potentially explosive reaction with metal nitrates, strong bases, and oxidizers. Citric Acid is incompatible with reducing agents. Citric Acid when wet or in solution is corrosive to brass, copper, zinc, aluminum and their alloys, lead, cast iron and steel (not stainless steel).

**Hazardous Decomposition** Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

##### Hazardous Polymerization

Hazardous polymerization will not occur.

#### \*\*\* Section 11 - Toxicological Information \*\*\*

##### Acute and Chronic Toxicity

###### A: General Product Information

Citric Acid has been reported to have allergenic properties, and might cause allergic contact dermatitis. Irritation of the skin, eyes, and gastrointestinal tract may occur, but should not require extensive therapy beyond dilution/irrigation. Dusts and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations. This product may cause moderate irritation of the skin. Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Dusts and mists from solutions may cause mild to moderate irritation to the nose and throat. Higher concentrations could cause coughing, sneezing, and labored breathing. Chronic, high concentration overexposure to Citric Acid can result in a reduction of plasma calcium concentration, which can lead to cardiac arrhythmias, reduced cardiac output and, in severe cases, death.

###### B: Component Analysis - LD<sub>50</sub>/LC<sub>50</sub>

###### Citric Acid (77-92-9)

LD<sub>50</sub> (Oral-Rat) 3 gm/kg; LD<sub>50</sub> (Oral-Mouse) 5040 mg/kg; Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD<sub>50</sub> (Subcutaneous-Rat) 5500 mg/kg; LD<sub>50</sub> (Subcutaneous-Mouse) 2700 mg/kg; Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD<sub>50</sub> (Intraperitoneal-Rat) 290 mg/kg; LD<sub>50</sub> (Intraperitoneal-Mouse) 903 mg/kg; LD<sub>50</sub> (Intravenous-Mouse) 42 mg/kg; Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or

function of salivary glands; LD<sub>50</sub> (Intravenous-Rabbit) 330 mg/kg

**B: Component Analysis - TDLo/TCLo/LD/LDLo**

**Citric Acid (77-92-9)**

LDLo (Oral-Rabbit) 7 gm/kg: Behavioral: tremor, convulsions or effect on seizure threshold, muscle contraction or spasticity

**Carcinogenicity**

**A: General Product Information**

No information identified.

**B: Component Carcinogenicity**

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

**Epidemiology**

No information available.

**Neurotoxicity**

Has not been identified.

**Mutagenicity** Citric Acid would not be expected to be genotoxic at physiological concentrations because it is a normal metabolite. It was not mutagenic in *Salmonella typhimurium*, and did not induce chromosome aberrations in cultured Chinese hamster fibroblast cells.

**Teratogenicity** Citric Acid did not cause reproductive effects when tested in experimental animals. The sodium salt of Citric Acid did not cause birth defects in rats. When given to rats at 1.2% in the diet over 2 generations, it did not affect reproduction. It did not affect litter size or survival of mice with prenatal exposure to up to 5% in the diet.

**Other Toxicological Information**

Persons with pre-existing eye, skin, respiratory, or allergic conditions may be more sensitive.

**\*\*\* Section 12 - Ecological Information \*\*\***

**Ecotoxicity**

**A: General Product Information**

Water Solubility = 59.2% (20°C); 84% (100°C). Biological Oxygen Demand (BOD): 40%, 5 days; 60%, 10-20 days. Citric Acid biodegrades quite rapidly. It is dangerous to aquatic life in high concentrations. Lowers pH in water but does not dissociate to any great extent.

Food Chain Concentration Potential: Very Low

**B: Ecotoxicity**

TLm (immersion-shore crab) 48 hours = 160 ppm (salt water); TLm (immersion-goldfish) 4 hr = 894 ppm (fresh water/ killed); EC<sub>0</sub> (*Pseudomonas putida* bacteria) 16 hours = >10,000 mg/L; EC<sub>0</sub> (*Microcystis aeruginosa* algae) 8 days = 80 mg/L; EC<sub>0</sub> (*Scenedesmus quadricauda* green algae) 7 days = 640 mg/L; EC<sub>0</sub> (*Entosiphon sulcatum* protozoa) 72 hours = 485 mg/L EC<sub>0</sub> (*Uronema parduczi* Chatton-Lwoff protozoa) = 622 mg/L; LD<sub>0</sub> (*Daphnia magna*) = 80 mg/L, long-time exposure in soft water; LD<sub>0</sub> (goldfish) = 625 mg/L, long-time exposure in hard water; LD<sub>100</sub> (goldfish) = 894 mg/l, long-time exposure in hard water; LD<sub>100</sub> (*Daphnia magna*) 120 mg/l long-time exposure in soft water; toxic (*Daphnia*) = 100 mg/L; period of survival at pH 4.0 (goldfish) 48 hours = 894 mg/L; period of survival at pH 4.5 (goldfish) 48 hours = 625 mg/L

**Environmental Fate**

Citric Acid is a naturally occurring chemical and is biodegradable. Octanol/Water Partition Coefficient Log P (oct): -1.72

**\*\*\* Section 13 - Disposal Considerations \*\*\***

**US EPA Waste Number & Descriptions**

**A: General Product Information**

Concentrated solutions may be considered D002 wastes (corrosive) by RCRA. Wastes should be tested prior to disposal to determine classification.

**B: Component Waste Numbers**

No EPA Waste Numbers are applicable for this product's components.

**Disposal Instructions** Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

**US DOT Information Shipping Name:** Non-regulated. **Hazard Class:** Not Applicable **UN/NA #:** Not Applicable **Packing Group:** Not Applicable **Required Label(s):** None **Additional Info.:** None.

**International Air Transport Association (IATA)**

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). "For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties."

**UN:** UN 3077

**Proper Shipping Name:** Environmentally hazardous substance, solid, n.o.s. (citric acid)

**Hazard Class:** 9  
**Packing Group:** III  
**Passenger & Cargo Aircraft Packing Instruction:** 911  
**Passenger & Cargo Aircraft Maximum Net Quantity:** 400 kg  
**Limited Quantity Packing Instruction (Passenger & Cargo Aircraft):** Y911  
**Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft):** 30 kg  
**Special Provisions:** A97 A149  
**ERG Code:** 9L

**International Maritime Organization (I.M.O.) Classification**

Citric Acid is not regulated under I.M.O.

**\*\*\* Section 15 - Regulatory Information \*\*\***

**US Federal Regulations**

**A: General Product Information**

No additional information.

**B: Component Analysis**

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4). SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Citric Acid. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

**C: Sara 311/312 Tier II Hazard Ratings:**

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Citric Acid	77-92-9	No	No	No	Yes	Yes

**State Regulations**

**A: General Product Information**

Other state regulations may apply.

**B: Component Analysis - State  
California Proposition 65**

Citric Acid is not on the California Proposition 65 chemical lists. Citric Acid and Water are listed as follows: NJ4: New Jersey other (included in 5 predominant ingredients >1%); PA3: Pennsylvania (non-hazardous - present at 3% or greater)

**Material Safety Data Sheet**

**Material Name: Citric Acid, Anhydrous ID: C1-110**

**\*\*\* Section 15 - Regulatory Information (Continued) \*\*\***

**B: Component Analysis – State (continued)**

Component	CAS #	CA	FL	MA	MN	NJ	PA
Citric Acid	77-92-9	No	No	No	No	Yes	Yes

**Other Regulations**

**A: General Product Information**

No additional information.

**B: Component Analysis - Inventory**

Component	CAS #	TSCA	DSL	EINECS
Citric Acid	77-92-9	Yes	Yes	Yes

**C: Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Citric Acid	77-92-9	1% item 409 (80)

**ANSI Labeling (Z129.1): WARNING! CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION.** Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep from contact with clothing. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRSTAID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO<sub>2</sub>, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

**\*\*\* Section 16 - Other Information \*\*\***

**Other Information**

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

**Key/Legend**

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health; NA = Not available or not applicable g = grams; kg = kilograms GRAS = Generally regarded as safe

**Contact: Sue Palmer-Koleman, PhD Contact Phone: (713) 896-9966 Revision log**

07/24/00 4:18 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.  
05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.  
07/24/01 2:59 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.  
5/22/03: 4:30 PM HDF General review and up-date of entire MSDS. Up-graded Section 8 to include PNOX exposure limits. Up-date of HMIS categories. Up-date of Section 8. Up-date of Section 14.  
6/22/05 12:52PM SEP Update IATA Section 14  
6/08/06 1:40 PM HDF Addition of Proposition 65 statement in Section 15  
11/9/06 3:15 pm SEP Corrected typo in Section 3  
10/17/07 3:58 PM SEP Update IATA Section 14

This is the end of MSDS # C1-110