Material Safety Data Sheet

Material Name: Ascorbic Acid, Anhydrous

ID: Cl-203

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Name: Ascorbic Acid, Technical and USP Grades

Product Use: For Manufacturing Use

Synonyms: Ascorbutina; Cevitamic Acid; Cetavitamin; 3-Keto-1-Gulofuranolactone; 1-3-Ketothreohexuronic Acid Lactone; L-Ascorbic Acid; 3-Oxo-1-Gulofuranolactone; Vitacin; Vitamin C; Vitamisin; Xitix; l-Xyloascorbic Acid

Supplier Information

Chem One Ltd.
8017 Pinemont Drive, Suite 100
Houston, Texas 77040-6519

Phone: (713) 896-9966
Fax: (713) 896-7540
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
50-81-7	Ascorbic Acid	99-100

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

Ascorbic Acid is a white to off-white, crystalline or granular solid, which has a mild odor. Ascorbic Acid is irritating to eyes, skin, gastrointestinal and renal systems, and respiratory tract. Ascorbic Acid poses a slight fire potential when heated. In addition, aqueous solutions of Ascorbic 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 Ascorbic 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! ASCORBIC ACID CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION. Do not breath dusts, or mists from solutions of product. Do not allow contact with eyes, skin, or clothing. Avoid generation of dusts, which can result in a dust explosion. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Potential Health Effects: Eyes

Dusts and solution of Ascorbic Acid may cause moderate irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be moderately corrosive to the eyes and cause corneal ulcerations.

Potential Health Effects: Skin

Ascorbic Acid may cause mild to moderate irritation of the skin. Repeated skin contact may lead to dermatitis (red, cracked skin). Symptoms are generally alleviated when exposure ends.

Potential Health Effects: Ingestion

Ascorbic Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, cramps, loss of appetite, and abdominal pain. Ingestion of large quantities can result in flushing or redness of the skin, headache, and increased urination. Chronic ingestion of high concentrations of Ascorbic Acid can result in erosion of tooth enamel. Chronic ingestion of high doses can also result in kidney stones, or lower or side back pain and increased systemic absorption of iron.

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. Symptoms are generally alleviated when exposure ends.

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

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

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush the contaminated eye with plenty of water for 15 minutes. Get medical attention if symptoms of pain, swelling, or tearing exist after flushing the eyes.

* * * Section 4 - First Aid Measures (Continued) * * *

First Aid: Skin

For skin contact, immediately wash extremely thoroughly with soap and water. Get medical attention if irritation develops or persists.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Have victim rinse mouth 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: Not applicable.
Method Used: Not applicable.
Upper Flammable Limit (UEL): Not available.
Lower Flammable Limit (LEL): Not available.
Auto Ignition: 660 deg. C (1220 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. Ascorbic 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

Dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Fire Fighting Equipment/Instructions

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

NFPA Ratings: Health: 1 **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. Neutralize with neutralizer appropriate for use with mildly acidic solids and solutions. 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 launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

* * * Section 7 - Handling and Storage * * *

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.

* * * Section 7 - Handling and Storage (Continued) * * *

Storage Procedures

Solutions in concentrations greater than 100 mg/L may undergo decomposition, producing carbon dioxide. Containers of such solutions should be vented periodically in order to prevent rupture. 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^3 TWA (Total dust)
5 mg/m^3 TWA (Respirable fraction)
DFG MAKs 4 mg/m^3 TWA (Inhalable fraction)
1.5 mg/m^3 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 Ascorbic 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 concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. 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 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).

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.

* * * Section 9 - Physical & Chemical Properties * * *

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.

Appearance:	White to off-white powder	**Odor:**	Odorless
Physical State:	Crystalline or granular Solid.	**pH:**	2 (10% solution), 3 (0.5% soln.)
Vapor Pressure:	7.9179 Pa at 465.15 deg K	**Vapor Density:**	Not applicable.
Boiling Point:	Decomposes	**Freezing/Melting Point:**	190-192 deg C (374-377.6 deg F)
Solubility (H2O):	80% at 100 deg. C; 30% at 20 deg C	**Specific Gravity:**	1.65 @ 20 deg C
Evaporation Rate:	Not applicable.	**Particle Size:**	Not determined.
Softening Point:	Not applicable.	**Bulk Density:**	0.55-1.2 g/mL
Viscosity:	Not applicable.	**Chemical Formula:**	C6H8O6
Percent Volatile:	Not applicable.	**Molecular Weight:**	176.13

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

Chemical Stability

Stable under normal conditions. Solutions in concentrations greater than 100 mg/L may undergo decomposition, producing carbon dioxide.

Chemical Stability: Conditions to Avoid

Heat, moisture and incompatible materials.

Incompatibility

Avoid contact with alkalis, iron, copper, zinc, aluminum, oxidizing agents, strong acids, water, air-oxidizing (metal) ions, theobromine, methenamine, potassium bromate and potassium nitrate. Do not formulate with sodium salicylate or sodium nitrate. In concentrations greater than 100 mg/ml , ascorbic acid may undergo decomposition with the production of carbon dioxide. Since increased pressure may develop after prolonged storage, ampoules containing ascorbic acid injections should be opened carefully.

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

Irritation of the skin, eyes, respiratory system, and gastrointestinal tract may occur, but should not require extensive therapy beyond dilution/irrigation. 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. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations. Ingestion of large quantities can result in flushing or redness of the skin, headache, and increased urination.

Chronic ingestion of high concentrations of Ascorbic Acid can result in erosion of tooth enamel. Chronic ingestion of high doses can also result in kidney stones, or lower or side back pain and increased systemic absorption of iron. Repeated skin contact may lead to dermatitis (red, cracked skin).

B: Component Analysis - LD50/LC50

Ascorbic Acid (50-81-7)

LD_{50} (Oral-Rat) 11,900 mg/kg; LD_{50} (Oral-Mouse) 3367 mg/kg; LD_{50} (Subcutaneous-rat) > 10 gm/kg

LD_{50} (Intravenous-rat) > 4 gm/kg; LD_{50} (Intravenous-Mouse) 518 mg/kg; LD_{50} (Intraperitoneal-mouse) 643 mg/kg

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

Ascorbic Acid (50-81-7)

LDLo (Intravenous-Woman) 900 mg/kg: Systemic effects; TDLo (Intravenous-Man) 2300 mg/kg/2 days: Blood effects; TDLo (Oral-rat) 2500 mg/kg: female 1-22 day(s) after conception: Reproductive: Fertility: post-implantation mortality; TDLo (Oral-mouse) 546 gm/kg/13 weeks-intermittent: Related to Chronic Data: death; TDLo (Oral-Guinea Pig, adult) 19,500 mg/kg (female 30-58 days post): Reproductive effects; TDLo (Intravenous-Mouse) 800 mg/kg (female 8 days post): Teratogenic effects

* * * Section 11 - Toxicological Information (Continued) * * *

Acute and Chronic Toxicity (continued)

B: Component Analysis - TDLo/TCLo/LD/LDLo (continued)

Ascorbic Acid (50-81-7)

TDLo (Intraperitoneal-mouse) 6680 mg/kg: female 11 day(s) after conception: fetal death; TDLo (Oral-Guinea Pig) 5800 mg/kg: female 1-58 day(s) after conception: stillbirth; Effects on Newborn: viability index; TDLo (Oral-Guinea Pig) 2471 mg/kg: multigenerations: Reproductive: Effects on Newborn: growth statistics (e.g. %, reduced weight gain)

Carcinogenicity

A: General Product Information

A carcinogenesis bioassay of L-Ascorbic Acid (> 97% pure) was conducted by administering diets containing 25,000 or 50,000 ppm L-Ascorbic Acid to groups of 50 F344/N rats and 50 B6C3F1 mice of each sex for 103 weeks. Controls consisted of 50 untreated rats and 50 untreated mice of each sex. Under the conditions of this bioassay, L-Ascorbic Acid was not carcinogenic for male or female F344/N rats or male or female B6C3F1 mice.

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

Mutation Test Systems (Human Cells-not otherwise specified) 200 µmol/L; Mutation Test Systems (Human Fibroblast) 200 µmol/L; Mutation Test Systems (mouse-Liver) 500 µmol/L; DNA Damage (Human-Fibroblast) 200 µmol/L; DNA Damage (Human-Cells-not otherwise specified) 200 µmol/L; DNA Inhibition (Human-HeLa cell) 2500 µmol/L; DNA Inhibition (Human Cells-not otherwise specified) 200 µmol/L; DNA Inhibition (Human Cells-not otherwise specified) 200 mg/L; DNA Damage (Mammal-species unspecified-Lymphocyte) 500 µmol/L; DNA Damage (Bacillus subtilis) 2 mg/disc; Micronucleus Test (Intraperitoneal-mouse) 4500 mg/kg/3 days-continuous; Micronucleus Test (hamster-Ovary) 400 mg/L; Cytogenetic Analysis (Intraperitoneal-mouse) 1600 mg/kg; Cytogenetic Analysis (hamster-Ovary) 300 mg/L; Sister Chromatid Exchange (Intraperitoneal-mouse) 1600 mg/kg; Sister Chromatid Exchange (hamster-Ovary) 500 mg/L; Mutation in Microorganisms (Microorganism-not otherwise specified) 1000 ppm; Mutation in Microorganisms (Neurospora crassa) 2 mmol/L; DNA Repair (Saccharomyces cerevisiae) 100 mg/L; Gene Conversion and Mitotic (Saccharomyces cerevisiae) 300 mg/L; Sex Chromosome Loss and Nondisjunction (Saccharomyces cerevisiae) 100 mg/L; Sperm Morphology (Parenteral-silkworm) 25 µg; mmg (Salmonella typhimurium) 500 mg/plate

Teratogenicity

No data currently available.

Other Toxicological Information

There are reports that large doses by ingestion cause a disruption of psychological functioning, resulting in decreased reaction times and psychomotor coordination. Ingestion of large doses may be hazardous to persons with hemochromoatosis (abnormal retention of iron in tissues), thalassemia or sideraoblastic anemias, as an increase in absorption of iron may occur systemically.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Water Solubility = 30.2% (20°C). Food Chain Concentration Potential: Very Low

Discharges of large quantities may be dangerous to aquatic life in high concentrations. Lowers pH in water but does not dissociate to any great extent. Dissociation Constants: pK1 = 4.17; pK2 = 11.57. Log Kow - -2.15 at 23 deg C; Log Kow at -2.00 at 37 deg C.

B: Aquatic Toxicity

LC_{50} (trout) water 1020 mg/L

Environmental Fate

Ascorbic Acid biodegrades rapidly.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, this product is not considered a hazardous waste.

* * * Section 13 - Disposal Considerations (Continued) * * *

US EPA Waste Number & Descriptions (continued):

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.

* * * Section 14 - Transportation Information * * *

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. (ascorbic acid)
Hazard Class: 9
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: No Limit
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg
Special Provisions: A97
ERG Code: 9L

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

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

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

Ascorbic Acid is Generally Accepted as Safe (GRAS) when used as a food additive for humans or animals, when used in accordance with good manufacturing practice or feeding practice.

B: Component Analysis

Ascorbic Acid has no requirements under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Ascorbic 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
Ascorbic Acid	50-81-7	No	No	No	Yes	Yes

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

State Regulations

A: General Product Information

Other state regulations may apply

A: General Product Information

California Proposition 65

Ascorbic Acid is not on the California Proposition 65 chemical lists.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Ascorbic Acid	50-81-7	No	No	No	No	No	No

Other Regulations

A: General Product Information

Canadian WHMIS Classification: Not applicable.

B: Component Analysis - WHMIS IDL

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

Component	**CAS #**	**Minimum Concentration**
Ascorbic Acid	50-81-7	No disclosure requirement

ANSI Labeling (Z129.1):

WARNING! CAUSES EYE, SKIN, GASTROINTESTINAL SYSTEM, AND RESPIRATORY TRACT IRRITATION. 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-approved respiratory protection, as appropriate. **FIRST-AID:** 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_2, 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

* * * Section 16 - Other Information (continued)* * *

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

Revision Log

07/18/00 3:58 PM SEP Changed company name , Section 1 and 16, from Corporation to Ltd.
05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, 311/312 SARA ratings added.
07/24/01 3:48 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
09/16//03 9:34 PM HDF Overall review of MSDS. Up-date of HMIS categories. Up-date of exposure limits for Particulates Not Otherwise Classified Up-date of Section 8 and Section 14
06/22/05 12:03 PM SEP Updated IATA Section 14.

This is the end of MSDS # Cl-203