



MATERIAL SAFETY DATA SHEET

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

BASIC CHEMICAL SOLUTIONS

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): **Hydrochloric Acid 7% – 35%**

CHEMICAL NAME/CLASS: Hydrochloric Acid Solution

SYNONYMS: Muriatic acid, Aqueous hydrogen chloride

PRODUCT USE: Metal processing and pH adjustment for water treatment

SUPPLIER/MANUFACTURER'S NAME: **BASIC CHEMICAL SOLUTIONS**

ADDRESS: **Corporate Office**
525 Seaport Blvd.
Redwood City, CA 94063

BUSINESS PHONE: 800-411-4227

EMERGENCY PHONE: **CHEMTREC: 800-424-9300**

DATE OF PREPARATION: October 10, 2003

Si usted no entiende las Hojas de Informacion de Seguridad sobre Materials, busque a alguien para que se la explique a usted en detalle.

(If you do not understand the Material Safety Data Sheet, find someone to explain it to you in detail.)

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	%w/w	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER mg/m ³
			TLV mg/m ³	STEL mg/m ³	PEL mg/m ³	STEL mg/m ³	IDLH	
Hydrochloric Acid	7647-01-0	7% - 35%	5 ppm ceiling	5 ppm ceiling	5 ppm ceiling	5 ppm ceiling	50 ppm	NA
Water and other ingredients. The other ingredients are each present in less than 1 percent concentration in this product.		Balance	The components present in the balance of this product do not contribute any significant, additional hazards. All hazard information pertinent to this product has been presented in the remaining sections of this Material Safety Data Sheet, per the requirements of Federal Occupational Safety and Health Hazard Communication Standard (29 CFR 1910.1200).					

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 Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear to slightly yellow solution with a pungent odor. This solution is corrosive, and can be damaging to tissue. Harmful if inhaled. Ingestion or inhalation of large quantities can be fatal. In the event of fire or spill, adequate precautions must be taken. This product will not decompose at temperatures below 1500°C(2730°F). Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas. This product is not flammable but reacts with most metals to form explosive/flammable hydrogen gas. Emergency responders must wear the proper personal protective equipment suitable for the situation to which they are responding. Read entire MSDS for a more through evaluation of the hazards.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

INHALATION: Vapor or mist from concentrated solutions can cause severe nasal irritation, sore throat, choking, coughing and difficulty breathing (50-100 ppm). Prolonged exposures can cause burns and ulcers to the nose and throat. Severe exposures (e.g. 1000-2000 ppm), for even a few minutes, can cause a life-threatening accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema such as shortness of breath can be delayed for several hours after the exposure.

CONTACT WITH SKIN: Contact with the skin may cause severe irritation, skin burns and permanent skin damage. Prolonged exposure may result in ulcerating burns which could leave scars. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin.

CONTACT WITH EYES: Contact with the eyes may cause severe irritation, eye burns and permanent eye damage, which may result in permanent blindness. Low concentrations of vapors or mist (10-35 ppm) can be immediately irritating, causing redness.




INGESTION: If ingested, solutions can cause corrosive burns to mouth, throat, esophagus and stomach. Symptoms may include difficulty in swallowing, intense thirst, nausea, vomiting, diarrhea and in severe cases, collapse and death. Small amounts of acid which enter the lungs during ingestion or aspiration while vomiting can cause serious lung injury and death.

INJECTION: Though injection is not anticipated to be a significant route of over-exposure to this product, if it occurs, it may cause severe irritation, skin burns and permanent skin damage.

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

ACUTE: This solution is corrosive, and can burn and damage eyes, skin, mucous membranes, and any other exposed tissue. If inhaled, irritation of the respiratory system may occur, with coughing, and breathing difficulty. Though unlikely to occur during occupational use, ingestion or injection of large quantities may be fatal.

CHRONIC: Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin. Repeated exposure to low concentrations of mist can cause brownish discoloration and damage to tooth enamel. Dental erosion becomes more severe with increased exposure. Repeated exposure to low concentrations can cause nose and gum bleeding. Chronic bronchitis and stomach pain (gastritis) have also been reported.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	3
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	1
PROTECTIVE			D
EYES	RESPIRATOR	HAND	BODY
	SEE SECTION		
For routine industrial applications			

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

4. FIRST-AID MEASURES

SKIN EXPOSURE: If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Remove contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes and hold eyelids open during flushing. Minimum flushing is for 20 minutes. Victim must seek immediate medical attention.

4. FIRST-AID MEASURES (Continued)

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. Give artificial respiration ONLY if breathing has stopped. 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. Give Cardiopulmonary Resuscitation (CPR) if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY. Symptoms may appear up to 48 hrs after exposure.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should rinse mouth with large amounts of water. Victim should drink one glass of water to dilute the ingested material. If milk is available, it may be administered after the water has been given. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Never induce vomiting or give water to someone who is unconscious, having convulsions, or who cannot swallow.

NOTE TO PHYSICIAN: This product may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. DO NOT attempt to neutralize the acid with weak bases since the reaction will produce heat that may extend the corrosive injury. 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.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): Not flammable.

AUTOIGNITION TEMPERATURE, °C: Not flammable.

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES

Carbon Dioxide: YES small fires

Foam: YES

Dry Chemical: YES small fires

Halon: NO

Other: NO.

Do not use carbon dioxide if cyanides are involved in a fire.

Water fog is effective for controlling vapors.

Controlled water addition is an effective method to reduce vapor pressure and control vapor emissions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is corrosive, and presents a significant inhalation and contact hazard to fire-fighters. This product will not decompose at temperatures below 1500°C(2730°F). Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas. Reacts with many metals to liberate hydrogen gas, which can form explosive mixtures.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

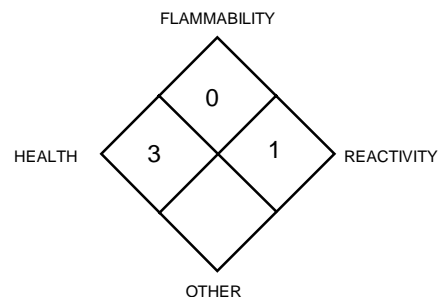
SPECIAL FIRE-FIGHTING PROCEDURES: Fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. If possible, prevent run-off water from entering storm drains, bodies of water, or other environmentally sensitive areas.

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, protect people, and respond with trained personnel. The proper personal protective equipment for incidental releases (e.g.-1 L of the product released in a well-ventilated area) use impermeable gloves, specific for the material handled, goggles, face shield, respirator and appropriate body protection.

In the event of a large release, don proper protective equipment, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard-hat. Self Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, Select

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES (Continued)

NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations.

Deny access to the area. Determine isolation distance. Stop leak at source, dike area, pick up with pump as much material as possible, prevent material for entering waterway prevent contact with other chemicals. Absorb spilled liquid with polypads or other suitable absorbent materials. Neutralize residue with lime or soda ash or other acid-neutralizing agent. Decontaminate the area thoroughly. Test area with litmus paper to confirm neutralization. Place all spill residues in a suitable container. Dispose of in accordance with Federal, State and local hazardous waste disposal regulations (see Section 13 – Disposal Considerations.)

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

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU.

Locate safety shower and eyewash station close to chemical handling area. Wash hands after handling this product. Do not eat or drink while handling this material. Remove contaminated clothing immediately. Use ventilation and other engineering controls to minimize potential exposure to this product.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing mists or sprays generated by this product. Use in a well-ventilated location.

For Non-Bulk Containers: Open containers slowly, on a stable surface. Containers of this product must be properly labeled. Only store in acid resistant containers. 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. Keep container tightly closed when not in use. Wash thoroughly after using this material. Storage areas should be made of fire-resistant materials. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

Empty containers may contain residual liquid. Therefore, empty containers should be handled with care.

Bulk Containers: All tanks and pipelines which contain this material must be labeled. All equipment must be designed for use with this product, Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

Tank Car Shipments: Tank cars carrying this product should be loaded and unloaded in strict accordance with tank-car manufacturer's recommendation and all established on-site safety procedures. Appropriate personal protective equipment must be used (see Section 8, Engineering Controls and Personal Protective Equipment.). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level, brakes must be set or wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tank (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. All equipment must be designed for use with this product, hoses must be verified to be clean and free of incompatible chemicals, prior to connection to the tank car or vessel. Valves and hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment before maintenance begins by a triple-rinse with water followed, if necessary, by using acid neutralizing agent and an additional rinse. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: If required use a corrosion-resistant ventilation system separate from other exhaust ventilation systems to ensure that there is no potential for overexposure to sprays, or mists of this product and that exposures are below those in section 2. Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below exposure limits listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed, use only protection authorized in 29 CFR

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

1910.134, or applicable State regulations. If adequate ventilation is not available or if there is potential for airborne exposure above the exposure limits (listed in Section 2) a respirator may be worn up to respirator exposure limitations, check with respirator equipment manufactures recommendations/limitations. For a higher level of protection use positive pressure supplied air respiration protection or Self Contained Breathing Apparatus or if oxygen levels are below 19.5% or are unknown.

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:

Positive pressure, full-facepiece Self Contained Breathing Apparatus; or positive pressure, full-facepiece Self Contained Breathing Apparatus with an auxiliary positive pressure Self Contained Breathing Apparatus are required.

EYE PROTECTION: Splash goggles or safety glasses. Face-shields are recommended when the operation can generate splashes, sprays or mists.

HAND PROTECTION: Wear appropriate gloves for routine industrial use. Use appropriate gloves for spill response, as stated in Section 6 of this MSDS (Accidental Release Measures).

BODY PROTECTION: Use body protection appropriate for task. Cover-all, rubber aprons, or chemical protective clothing made from natural rubber or other appropriate materials are generally acceptable, depending upon the task.

9. PHYSICAL and CHEMICAL PROPERTIES

Physical and chemical properties for Hydrochloric Acid, a main component of this product, are as follows:

Hydrochloric Acid						
Percentage	7	15	25	27.92	31.45	35.21
Baume	5	10	16.3	18	20	22
BOILING POINT @ 760 mm Hg:	103°C (217°F)	105°C (221°F)	100C (212°F)	98°C (208°F)	85°C (185°F)	62°C (143°F)
FREEZING POINT:	NA	NA	NA	-58	-40	-31
VAPOR PRESSURE mm Hg @ 20°C:	NA	NA	NA	11	20	72
SPECIFIC GRAVITY @ 15.6°C	1.03	1.07	1.13	1.14	1.16	1.18
DENSITY -- lb-gal @ 15.6°C:	8.59	8.92	9.40	9.51	9.67	9.84
Molecular Weight	36.46					
PHYSICAL STATE:	Liquid					
% Volatile by Volume	100					
% Volatile Organic Compound	Zero					
pH:	< 1 pH					
SOLUBILITY in H ₂ O - % by wt:	Completely Soluble					

ODOR THRESHOLD: Not available.

APPEARANCE AND COLOR: This is a clear liquid with sharp penetrating, irritating odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): Litmus paper will turn red upon contact with even low concentrations of this solution.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: This product when heated will decompose and emit toxic hydrogen chloride fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product reacts with strong oxidizing agents, reducing agents, metals, bases, aldehydes, epoxides, explosives, acetylides, borides, carbides, silicides, cyanides, sulfides and phosphides. Do not mix this product with sodium hypochlorite, sodium bisulfite, chlorine sanitizers or chlorinated cleaners – a deadly gas can be formed. Reacts with common metals to liberate hydrogen gas, which can form explosive mixtures in the air.

HAZARDOUS POLYMERIZATION: HCL will not polymerize. Reaction with some incompatible materials such as acetylides and epoxides can cause polymerization.

CONDITIONS TO AVOID: Avoid exposure or contact to extreme temperatures, sparks, other sources of ignition and incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Additional toxicology information for components greater than 1 percent in concentration is provided below.

HYDROCHLORIC ACID:

LD₅₀ (rabbit) 900 mg/kg 100% HCl.

LD₅₀ (rat) 3124 ppm/ for 1 hour@ 100% HCl.

LC50 (inhalation,mouse)=1108 ppm/1 hr

Eye Effects (rabbit): Application of a 1% hydrochloric acid (0.25N) solution for 20 seconds caused scarring of the cornea. Other studies have reported that application of 5 mg for 30 seconds caused mild irritation, and that application of a 5% solution caused minimal irritation (duration not indicated). Skin Effects (rabbit): Application of 0.5 mL of a 17% concentrated solution for 4 hours caused corrosive burns.

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA; and are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product is severely irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: Not known to be a sensitizer.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: Mutagenic effects have been reported in one bacterial test (E. Coli-DNA repair), in three insect tests (Drosophila, grasshopper) and in one in vitro mammalian cell test (hamster lung cells). HCl was negative in another in vitro mammalian cell test (Syrian Hamster Embryo cells). The significance of the positive reports is questionable since pH (acidity) can influence the results of short-term tests.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: Female rats were exposed to 450 mg/m³ for 1 hour either prior to mating or on day 9 of pregnancy.

Developmental effects were observed in the offspring. However, this exposure caused toxic effects, including mortality, in the mothers.

A *mutagen* is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational 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: Currently there are no Biological Exposure Indices (BEIs) associated with the components of this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Skin disorders can be aggravated by over-exposure to this product. Inhalation of this products mists may aggravate respiratory conditions.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product are relatively stable in the environment; they may degrade, after time, into other organic and inorganic constituents.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: The concentration of this product that was found to be injurious to crops is 350 mg/l. This product can be harmful or fatal to plant and animal life if improperly released into the environment. As with all chemicals, work practices should be aimed at eliminating environmental releases. Refer to Section 11 (Toxicological Information) for further toxicological data.

EFFECT OF CHEMICAL ON AQUATIC LIFE This product can substantially lower the pH of an aquatic environment and can be extremely toxic to fish and aquatic plants. The toxicity is primarily associated with the pH. As with all chemicals, work practices should be aimed at eliminating environmental releases. Additional aquatic data for the components of this product is available as follows:

HYDROCHLORIC ACID:

LC₅₀ mosquito fish = 282 mg/l 96 hours

LC₅₀ fathead minnow = 21900 ug/l 96 hours

LC₅₀ trout = 10 mg/l 24 hours

LC₅₀ shrimp = 100 to 330 mg/l 48 hours (salt water)

LC₅₀ Gold fish = 178 mg/l 48 hours (salt water)

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: D002 (Characteristic, Corrosivity), applicable to wastes consisting only of this solution.

14. TRANSPORTATION INFORMATION

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

PROPER SHIPPING NAME: Hydrochloric Acid

HAZARD CLASS NUMBER and DIVISION: 8 Corrosive

UN IDENTIFICATION NUMBER: UN 1789

PACKING GROUP: II

DOT LABEL(S) REQUIRED: Corrosive

CERCLA REPORTABLE QUANTITY (RQ): Hydrochloric Acid = 5000 lbs.

ERAP (Canadian: TDG CLR Clear Language Regulation): Regulated Limit: Hydrochloric Acid = 3000 kg.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 157

MARINE POLLUTANT: This product does not contain any components which are designated by the Department of Transportation to be Marine Pollutants. (49 CFR 172.101, Appendix B).

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

Note: The latest DOT information is provided, please verify all DOT information as it is subject to change without notice.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: The components of this product subject to the reporting requirements of Section 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act are as follows.

COMPONENT	SARA 302	SARA 304	SARA 313
Hydrochloric Acid	No	No	No

TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER FEDERAL REGULATIONS: Not applicable.

STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

California – Director’s List of Hazardous Substances

Florida - Hazardous Substances List

Massachusetts - Extraordinarily Hazardous Substance

Minnesota - Hazardous Substance List

New Jersey - Hazardous Substance List, Environmental Hazardous Substance List, Special Health Hazardous Substance List,

Other ingredients >1%

Pennsylvania - Hazardous Substance List, Environmental Hazardous Substance List

Rhode Island - Hazardous Substance List

Canada – WHMIS Ingredient Disclosure List over 1%

Right –To-Know: Illinois, Massachusetts, New Jersey, Pennsylvania

15. REGULATORY INFORMATION (Continued)

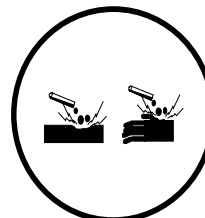
LABELING (Precautionary Statements): **DANGER!** CORROSIVE MATERIAL! LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. MAY CAUSE LUNG DAMAGE. Do not get into eyes, on skin or clothing. Avoid breathing spray or mist. Do not take internally. Use with adequate ventilation and employ respiratory protection when exposed to the mist or spray. When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing. Do not transfer to unlabeled containers. Wash thoroughly after handling, keep container closed when not in use. **FIRST AID:** In case of contact, immediately flush skin or eyes for at least 20 minutes. If inhaled, move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not induce vomiting. **IN CASE OF FIRE:** Use water or foam. **IN CASE OF SPILL:** Neutralize residue with acid neutralizing agent. Refer to MSDS for additional information.

TARGET ORGANS: Skin, eyes and respiratory system.

WHMIS SYMBOLS:

D1A- Poisonous and Infectious Materials
Very Toxic Materials

E- Corrosive Material



16. OTHER INFORMATION

INFORMATION SOURCE:

CHEMICAL SAFETY ASSOCIATES, Inc.

PREPARED BY:

BASIC CHEMICAL SOLUTIONS, LLC

THIS INFORMATION IS DRAWN FROM RECOGNIZED SOURCES BELIEVED TO BE RELIABLE. BASIC CHEMICAL SOLUTIONS, LLC MAKES NO GUARANTEES NOR ASSUMES ANY LIABILITY IN CONNECTION WITH THIS INFORMATION. THE USER SHOULD BE AWARE OF CHANGING TECHNOLOGY, RESEARCH, REGULATIONS AND ANALYTICAL PROCEDURES THAT MAY REQUIRE CHANGES HEREIN. THE ABOVE DATA IS SUPPLIED UPON THE CONDITION THAT PERSONS WILL EVALUATE THIS INFORMATION AND THEN DETERMINE ITS SUITABILITY FOR THEIR USE.

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 adsorption 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.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **National Fire Protection Association (NFPA)**. **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: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - 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/m³** 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; **TD₀₁**, **LDLo**, and **LD₀₁**, or **TC**, **TC₀₁**, **LCLo**, and **LC₀₁**, 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. Other acronyms used are: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substance 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.