



Mid-Continent Division

Section 1: Product and Company Identification

Product Name:	HALT 16	HMIS:	1-3-0-C-
Function:	Scale Remover		
Distributor:	Kel-Tech, A Clariant Company		
Physical Address:	801 Marshall Rd. Clinton, OK 73601	Mailing Address:	P.O. Box 849 Clinton, OK 73601
Phone Number:	(580) 323-8136	Fax Number:	(580) 323-8485
Prepared By:	Kel-Tech, Inc.	Date of Revision:	Monday, December 14, 2015

**24-Hour emergency Phone Number: (800) 424-9300 (CHEMTREC)
Use only for spills and releases.**

Section 2: Hazards Identification

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS - CATAGORY 2
- CAUSES SEVERE SKIN BURNS AND EYE DAMAGE - CATAGORY 1
- MAY CAUSE GENETIC DEFECTS - CATAGORY 1

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS Label elements, including precautionary statements

Pictogram(s):



Signal Word: DANGER

Hazard statement(s)

- MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS
- CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
- MAY BE HARMFUL IF INHALED
- MAY CAUSE GENETIC DEFECTS

Precautionary statement(s)

- Store locked up.
- Dispose of contents/container in accordance with local/regional regulation.
- Do not breath dust/mist.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Wash thoroughly after handling.
- Rinse mouth.
- Wash contaminated clothing before reuse.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use personal protective equipment as required.
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician Do NOT induce vomiting.
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- IF exposed or concerned: Get medical advice/attention.



Section 3: Hazardous Ingredients

Component	CAS#	WGT%	OTHER
Hydrochloric Acid	7647-01-0	<20	RQ 5000
Citric Acid	77-92-9	<5	

Section 4: First Aid Measures

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, while holding eyelids apart to ensure flushing of entire surface. Get immediate medical attention.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing, including shoes. Thoroughly clean clothing and shoes before reuse. Get medical attention.

Inhalation: Remove to fresh air. Give artificial respiration if not breathing. Give oxygen if breathing is difficult. Keep victim warm and Get immediate medical attention.

Ingestion: If swallowed, do **not** induce vomiting. Keep victims head below knee level to prevent vomit from aspiration into lungs. Get immediate medical attention. **NOTE:** Never give anything by mouth to an unconscious person.

Section 5: Fire Fighting Measures

Extinguishing Media: Agents approved for Class B hazards, (i.e. water fog, foam, dry chemical, and carbon dioxide).

Special Fire Fighting Procedures: Do not enter confined space without full bunker gear and self-contained breathing apparatus. Treat as Class B oil fire. Keep sealed containers cool with water spray.

Unusual Fire and Explosion Hazards: **Containers may explode from internal pressure if confined to fire. Cool with water.**

Section 6: Accidental Release Measures

Steps to be taken in case material is released or spilled: Responders should wear PPE. Evacuate all unnecessary personnel from area. Remove or shut off all sources of ignition. Increase ventilation if possible. Stop leak if possible. Spilled material should be contained and removed by mechanical means, such as, absorbing with inert material and placing it in a properly labeled waste receptacle. Do not let run off water go to lakes, streams, etc.

Section 7: Handling and Storage

Precautions to be taken in handling and storing: Use appropriate PPE as outlined in Section VIII. Keep away from ignition sources (e.g., heat, sparks, flames, etc.). Keep container closed. Ground and bond containers when transferring liquids. Use with adequate ventilation. Do not breathe vapors. Do not cut, puncture, or weld on or near this container.

Conditions for safe storage, including and incompatibilities: Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage and moisture. Separate from incompatibles, combustibles, organic or other readily oxidizable materials. Containers of this material may be hazardous when empty since they retain product residues (liquid, vapors); observe all warnings and precautions listed for the product. Do not cut, puncture, or weld on or near this container.

Section 8: Exposure Controls / Personal Protective Measures

Component	List	Type	Value
2-Butoxyethanol*	ACGIH	TWA	20ppm
	ACGIH	Notation:	Confirmed Animal Carcinogen with Unknown Relevance to Humans
	OSHA	TWA	50ppm
	OSHA	Notation:	Skin
Ethylene Glycol	ACGIH	STEL	100mg/m3 C
	ACGIH	Notation:	Not Classifiable as a Human Carcinogen



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Hydrochloric Acid	ACGIH	TWA	2ppm C
	ACGIH	Notation:	Not Classifiable as a Human Carcinogen
	OSHA	TWA	5ppm C
Isopropanol	ACGIH	TWA	200ppm
	ACGIH	STEL	400ppm
	OSHA	TWA	400ppm
N,N-Dimethyl Formamide	ACGIH	TWA	10ppm
	ACGIH	Notation:	Not Classifiable as a Human Carcinogen; End of shift, N-Methylformamide in urine 15mg/L
	OSHA	TWA	10ppm
	OSHA	Notation:	SKIN

Respiratory Protection: Use OSHA/NIOSH/MSHA approved air supplied respirator for organic vapors. Entry into confined space requires self-contained positive breathing apparatus.

Ventilation:

Local Exhaust: Yes, equal to fresh air

Mechanical Exhaust: Exhaust fan recommended to control exposure levels.

Special: Control airborne concentrations below exposure guidelines.

Personal Protective Equipment: Chemical resistant gloves (polyvinyl alcohol or Buna-N), chemical splash goggles, chemical resistant footwear, and chemical resistant aprons are recommended when handling the product.

Other Protective Equipment: Eye wash and safety showers should be readily available

Work and Hygienic Practices: Avoid breathing chemicals, wash hands before eating, drinking or smoking

Section 9: Physical and Chemical Properties

Appearance/Odor:	<u>Clear Yellow/Pungent</u>	pH:	<u>0.14 to 0.94</u>
State:	<u>Liquid</u>	Solubility in Water:	<u>Soluble</u>
Specific Gravity (g/ml):	<u>1.109 to 1.118</u>	Pour Point:	<u>N/D</u>
Boiling Point:	<u>212°F</u>	Viscosity (cps):	<u>N/D</u>
Flash Point:	<u>>200°F</u>	Vapor Pressure:	<u>N/D</u>
UEL (Calculated):	<u>N/A</u>	Evaporation Rate:	<u>N/D</u>
LEL (Calculated):	<u>N/A</u>	Vapor Density:	<u>N/D</u>
Auto-ignition Temperature:	<u>N/D</u>	n-Octanol/Water:	<u>N/D</u>
Decomposition Temperature:	<u>N/D</u>		

Section 10: Stability and Reactivity

Chemical Stability: This product is stable in closed containers at room temperature.

Conditions to Avoid: Air exposure and excessive heat.

Incompatible Materials: Strong acids, bases, strong oxidizers, flame, heat

Decomposition Products: Thermal Decomposition: Carbon dioxide, Carbon monoxide, smoke and oxides of nitrogen.

Hazardous Polymerization: Will not occur

Section 11: Toxicological Information

No specific toxicity tests have been conducted on this product. Components have shown to be toxic.

2-BUTOXYETHANOL* - Poison by ingestion, skin contact, intraperitoneal, and intravenous routes. Moderately toxic via inhalation and subcutaneous routes. Human systemic effects by inhalation: nausea or vomiting, headache, unspecified eye effects. Experimental teratogenic and reproductive effects. A skin irritant.

TOXICITY DATA:

Skin-Rabbit, adult, 500 mg open Mild irritation effects **Inhalation-Rat, adult male**, TCLo: 200 ppm/6H (female 6-15D post): Reproductive effects **Oral-Mouse**, TDLo: 9440 mg/kg (female 7-14D post): Reproductive effects **Inhalation-Rabbit, adult**, TCLo: 200 ppm/6H (female 6-18D post): Reproductive effects **Inhalation-Rabbit, adult**, TCLo: 100 ppm/6H (female 6-18D post): Teratogenic effects **Inhalation-Rat, adult male**, TCLo: 25 ppm/6H (female 6-15D post): Teratogenic effects **Oral-Woman**, TDLo: 600 mg/kg **Inhalation-Human**, TCLo: 195 ppm/8H: Gastrointestinal tract effects **Inhalation-Human**, TCLo: 100 ppm: NOSE, Eye effects, Central nervous system effects **Oral-Rat, adult male**, LD50: 470 mg/kg **Inhalation-Rat, adult male**, LC50: 2900 mg/m³ **Intraperitoneal-Rat, adult male**, LD50: 220 mg/kg **Intravenous-Rat, adult male**, LD50: 340 mg/kg **Inhalation-Mouse**, LC50: 700 ppm/7H **Subcutaneous-Mouse**, LDLo: 500 mg/kg **Oral-Rabbit, adult**, LD50: 300 mg/kg **Skin-Guinea Pig, adult**, LD50: 230 mg/kg



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CITRIC ACID - Poison by intravenous route. Moderately toxic by subcutaneous and intraperitoneal routes. Mildly toxic by ingestion. A severe eye and moderate skin irritant. An irritating organic acid, some allergenic properties.

TOXICITY DATA:

Skin-Rabbit, adult, 500 mg/24H Moderate irritation effects *Eyes-Rabbit, adult*, 750 µg/24H Severe irritation effects *Oral-Rat, adult male*, LD50: 3 g/kg *Intraperitoneal-Rat, adult male*, LD50: 883 mg/kg *Subcutaneous-Rat, adult male*, LD50: 5500 mg/kg *Oral-Mouse*, LD50: 5040 mg/kg *Intraperitoneal-Mouse*, LD50: 903 mg/kg *Subcutaneous-Mouse*, LD50: 2700 mg/kg *Intravenous-Mouse*, LD50: 42 mg/kg *Oral-Rabbit, adult*, LDLo: 7000 mg/kg *Intravenous-Rabbit, adult*, LD50: 330 mg/kg

ETHYLENE GLYCOL - Human poison by ingestion. (Lethal dose for humans reported to be 100 mL.) Moderately toxic to humans by an unspecified route. Moderately toxic experimentally by ingestion, subcutaneous, intravenous, and intramuscular routes. Human systemic effects by ingestion and inhalation: eye lachrymation, general anesthesia, headache, cough, respiratory stimulation, nausea or vomiting, pulmonary, kidney, and liver changes. If ingested it causes initial central nervous system stimulation followed by depression. Later, it causes potentially lethal kidney damage. Very toxic in particulate form upon inhalation. An experimental teratogen. Other experimental reproductive effects. Human mutation data reported. A skin, eye, and mucous membrane irritant.

TOXICITY DATA:

Eyes-Rat, adult male, 12 mg/m³/3D *Skin-Rabbit, adult*, 555 mg open Mild irritation effects *Eyes-Rabbit, adult*, 500 mg/24H Mild irritation effects *Eyes-Rabbit, adult*, 100 mg/1H Mild irritation effects *Eyes-Rabbit, adult*, 12 mg/m³/3D *Eyes-Rabbit, adult*, 1440 mg/6H Moderate irritation effects *DNA Inhibition-Human*, 320 mmol/L *Msc-Mouse*, 100 mmol/L *Oral-Mouse*, TDLo: 84 g/kg (female 1-21D post): Reproductive effects *Oral-Mouse*, TDLo: 88,720 mg/kg (female 7-14D post): Reproductive effects *Oral-Rat, adult male*, TDLo: 8580 mg/kg (female 6-15D post): Teratogenic effects *Oral-Rat, adult male*, TDLo: 25 g/kg (female 6-15D post): Reproductive effects *Oral-Mouse*, TDLo: 15 g/kg (female 6-15D post): Reproductive effects *Oral-Rat, adult male*, TDLo: 50 g/kg (female 6-15D post): Reproductive effects *Oral-Rat, adult male*, TDLo: 50 g/kg (6-15D preg): Teratogenic effects *Oral-Rat, adult male*, TDLo: 12,500 mg/kg (female 6-15D post): Teratogenic effects *Oral-Child*, TDLo: 5500 mg/kg: Central nervous system effects, Pulmonary system effects, *KID Oral-Human*, LDLo: 786 mg/kg *Oral-Human*, LDLo: 398 mg/kg: Central nervous system effects, Gastrointestinal tract effects, *LIV Inhalation-Human*, TClO: 10,000 mg/m³: Eye effects, Pulmonary system effects *Unreported-Man*, LDLo: 1637 mg/kg *Oral-Rat, adult male*, LD50: 4700 mg/kg *Intraperitoneal-Rat, adult male*, LD50: 5010 mg/kg *Subcutaneous-Rat, adult male*, LD50: 2800 mg/kg *Intravenous-Rat, adult male*, LD50: 3260 mg/kg *Intramuscular-Rat, adult male*, LDLo: 3300 mg/kg *Oral-Mouse*, LD50: 7500 mg/kg *Intraperitoneal-Mouse*, LD50: 5614 mg/kg *Subcutaneous-Mouse*, LDLo: 2700 mg/kg

HYDROCHLORIC ACID - A human poison by an unspecified route. Mildly toxic to humans by inhalation. Moderately toxic experimentally by ingestion. A corrosive irritant to the skin, eyes, and mucous membranes. Mutation data reported. An experimental teratogen. A concentration of 35 ppm causes irritation of the throat after short exposure. In general, hydrochloric acid causes little trouble in industry other than from accidental splashes and burns. It is a common air contaminant and is heavily used in industry.

TOXICITY DATA:

Eyes-Rabbit, adult, 100 mg rns Mild irritation effects *DNA Repair-Escherichia Coli*, 25 µg/well *Cytogenetic Analysis-Grasshopper:Parenteral*, 20 mg NULSAK 9,119,66 *Inhalation-Rat, adult male*, TClO: 450 mg/m³/1H (1D pre): Teratogenic effects *Inhalation-Human*, LCLo: 1300 ppm/30M *Inhalation-Human*, LCLo: 3000 ppm/5M *Unreported-Man*, LDLo: 81 mg/kg *Inhalation-Rat, adult male*, LC50: 3124 ppm/1H *Inhalation-Mouse*, LC50: 1108 ppm/1H *Intraperitoneal-Mouse*, LD50: 1449 mg/kg *Oral-Rabbit, adult*, LD50: 900 mg/kg *Inhalation-Rabbit, adult*, LCLo: 4416 ppm/30M

ISOPROPANOL - Moderately toxic to humans by an unspecified route. Moderately toxic experimentally by intravenous and intraperitoneal routes. Mildly toxic by skin contact. Human systemic effects by ingestion or inhalation: flushing, pulse rate decrease, blood pressure lowering, anesthesia, narcosis, headache, dizziness, mental depression, hallucinations, distorted perceptions, dyspnea, respiratory depression, nausea or vomiting, coma. Experimental teratogenic and reproductive effects. Mutation data reported. An eye and skin irritant. Questionable carcinogen.

The single lethal dose for a human adult is about 250 mL, although as little as 100 mL can be fatal. It can cause corneal burns and eye damage. Acts as a local respiratory irritant and in high concentration as a narcotic. It has good warning properties because it causes a mild irritation of the eyes, nose, and throat at a concentration level of 400 ppm. It may induce a mild narcosis, the effects of which are usually transient, and it is somewhat less toxic than the normal isomer, but twice as volatile.

There is some evidence that humans can acquire a slight tolerance to this material. It is absorbed by the skin, but single or repeated applications on the skin of rats, rabbits, dogs, or human beings induced no untoward effects. It acts very much like ethanol in regard to absorption, metabolism, and elimination but with a stronger narcotic action. Chronic injuries have been detected in animals. Workers producing isopropanol show an excess of sinus and laryngeal cancers. This may be caused, completely or in part, by the by-product, isopropyl oil. Humans have ingested up to 20 mL diluted with water and noticed only a sensation of heat and slight lowering of the blood pressure. There are, however, reports of serious illness from as little as 10 mL taken internally. A common air contaminant.

TOXICITY DATA:

Skin-Rabbit, adult, 500 mg Mild irritation effects *Eyes-Rabbit, adult*, 16 mg *Eyes-Rabbit, adult*, 10 mg Moderate irritation effects *Cytogenetic Analysis-Saccharomyces cerevisiae*, 200 mmol/tube *Cytogenetic Analysis-Rat, adult male:Inhalation*, 1030 µg/m³/16 W-I *Oral-Rat, adult male*, TDLo: 6480 mg/kg (male 26 W pre): Reproductive effects *Inhalation-Rat, adult male*,



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TCLo: 10,000 ppm/7H (female 1-19D post): Teratogenic effects Inhalation-Rat, adult male, TCLo: 3500 ppm/7H (female 1-19D post): Teratogenic effects Oral-Rat, adult male, TDLo: 5040 mg/kg (female 1-20D post): Reproductive effects Inhalation-Rat, adult male, TCLo: 10,000 ppm/7H (female 1-19D post): Reproductive effects Oral-Rat, adult male, TDLo: 11,340 mg/kg (45D pre): Reproductive effects Inhalation-Rat, adult male, TCLo: 7000 ppm/7H (female 1-19D post): Teratogenic effects Oral-Man, TDLo: 14,432 mg/kg: Central nervous system effects, Cardiovascular effects, Pulmonary system effects Oral-Human, TDLo: 223 mg/kg: Central nervous system effects, Cardiovascular effects Oral-Man, LDLo: 5272 mg/kg Oral-Human, LDLo: 3570 mg/kg: Central nervous system effects, Pulmonary system effects, Gastrointestinal tract eff Unreported-Man, LDLo: 2770 mg/kg Oral-Rat, adult male, LD50: 5045 mg/kg Inhalation-Rat, adult male, LCLo: 16,000 ppm/4H Intraperitoneal-Rat, adult male, LD50: 2735 mg/kg Intravenous-Rat, adult male, LD50: 1099 mg/kg Oral-Mouse, LD50: 3600 mg/kg Inhalation-Mouse, LCLo: 12,800 ppm/3H Intraperitoneal-Mouse, LD50: 4477 mg/kg Subcutaneous-Mouse, LDLo: 6000 mg/kg Intravenous-Mouse, LD50: 1509 mg/kg Oral-Dog, adult, LD50: 4797 mg/kg Intravenous-Dog, adult, LDLo: 5120 mg/kg Intravenous-Cat, adult, LDLo: 1963 mg/kg Oral-Rabbit, adult, LD50: 6410 mg/kg Skin-Rabbit, adult, LD50: 12,800 mg/kg

N,N-DIMETHYL FORMAMIDE - Suspected carcinogen. Moderately toxic by ingestion, intravenous, subcutaneous, intramuscular, and intraperitoneal routes. Mildly toxic by skin contact and inhalation. Experimental teratogenic and reproductive effects. A skin and severe eye irritant. Human mutation data reported.

TOXICITY DATA:

Skin-Human, 100%/24H Mild irritation effects Skin-Rabbit, adult, 10 mg/24H open Eyes-Rabbit, adult, 100 mg RNS Severe irritation effects Microsomal Mutagenicity Assay-Salmonella typhimurium, 600 µg/plate Cytogenetic Analysis-Human:lymphocyte, 100 nmol/L Inhalation-Rat, adult male, TDLo: 600 mg/m3/24H (1-19D preg): Reproductive effects Inhalation-Rat, adult male, TCLo: 4 mg/m3/4H (1-19D preg): Teratogenic effects Skin-Rat, adult male, TDLo: 3600 mg/kg (11-13D preg): Teratogenic effects Intraperitoneal-Mouse, TDLo: 2100 mg/kg (female 11D post): Reproductive effects Inhalation-Rat, adult male, TCLo: 4 mg/m3/4H (1-19D preg): Reproductive effects Oral-Rabbit, adult, TDLo: 2600 mg/kg (female 6-18D post): Teratogenic effects Intraperitoneal-Mouse, TDLo: 15,120 mg/kg (female 1-14D post): Teratogenic effects Oral-Rat, adult male, LD50: 2800 mg/kg Intraperitoneal-Rat, adult male, LD50: 1400 mg/kg Subcutaneous-Rat, adult male, LD50: 3800 mg/kg Intravenous-Rat, adult male, LD50: 2000 mg/kg Oral-Mouse, LD50: 3750 mg/kg Inhalation-Mouse, LC50: 9400 mg/m3/2H Intraperitoneal-Mouse, LD50: 650 mg/kg Subcutaneous-Mouse, LD50: 4500 mg/kg Intravenous-Mouse, LD50: 2500 mg/kg Intramuscular-Mouse, LD50: 3800 mg/kg Intravenous-Dog, adult, LD50: 470 mg/kg Intraperitoneal-Cat, adult, LD50: 500 mg/kg Skin-Rabbit, adult, LD50: 4720 mg/kg

Section 12: Ecological Information

Ecological testing has not been conducted on this product. Material should be considered hazardous to aquatic life.

Section 13: Disposal Considerations

Waste Classification: Material should be disposed of by incineration or in an approved landfill in accordance with all federal, state, and local regulations. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the products meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting material hazardous. The container of this product can present physical or health hazards, even when emptied! To avoid risk of injury, do not cut, puncture, or weld on or near this container. Since emptied containers retain product residue, follow label warnings even after container is emptied.

Section 14: Transport Information

Department of Transportation

- DOT Identification Number: UN1760
DOT Proper Shipping Name: UN1760, Corrosive liquid, n.o.s., (Contains Hydrochloric Acid and Citric Acid), 8, PGIII
DOT Hazard Class: 8
DOT Identification Name: Corrosive liquid, n.o.s.
DOT Packaging Group: PGIII
RQ
2012 ERG Number: 154



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Section 15: Regulatory Information

CERCLA: If reportable quantity of this product is accidentally spilled the incident is subject to the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act and must be reported to the National Response Center by calling (800) 424-8802.

<u>CERCLA Component</u>	<u>CAS #</u>	<u>WT. %</u>	<u>RQ, lbs</u>	<u>Product RQ Value</u>
Hydrochloric Acid	7647-01-0	16.1	5000	31,074 lbs (3,347 gallons)
2-Butoxyethanol*	111-76-2	0	N230	
Ethylene Glycol	107-21-1	0	5000	10,181,583 lbs (1,096,769 gallons)
N,N-Dimethyl Formamide	68-12-2	0	100	203,632 lbs (21,935 gallons)

* Belongs to broad or generic class of Glycol Ethers with no assigned RQ, but classified as CERCLA hazardous substances.

SARA TITLE III: This product contains the following Extremely Hazardous Substance under EPCRA section 302/304 lists.

<u>EHS Component</u>	<u>CAS #</u>	<u>WT. %</u>	<u>RQ, lbs</u>	<u>TPQ, lbs</u>
None				

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:

Immediate (Acute) Health: X Delayed (Chronic) Health: X Fire: Pressure: reactive:

This product contains the following Section 313 Reportable Ingredients:

<u>313 Component</u>	<u>CAS #</u>	<u>WT. %</u>
2-Butoxyethanol*	111-76-2	0.0
Ethylene Glycol	107-21-1	0.0
N,N-Dimethyl Formamide	68-12-2	0.0

* 313 Category Code N230

Section 16: Other Information

Hazardous Material Identification System Category Rating:

Health:	3
Flammability:	1
Reactivity:	0
Personal Protection:	C

Hazardous Material Identification System Category Rating:

This rating scheme rates health, fire, and reactivity on a scale of 0 to 4.

0 = No significant hazard 1 = Slight Hazard 2 = Moderate Hazard 3 = High Hazard 4 = Extreme Hazard

Personal Protective Equipment Guide:

- | | |
|--|--|
| A = Safety Glasses | G = Safety Glasses, Gloves, Vapor Respirator |
| B = Safety Glasses, Gloves | H = Safety Glasses, Gloves, Apron, Vapor Respirator |
| C = Safety Glasses/Goggles, Gloves, Apron | I = Safety Glasses, Gloves, Apron, Dust & Vapor Respirator |
| D = Gloves, Apron, Face shield | J = Splash Goggles, Gloves, Apron, Dust & Vapor Respirator |
| E = Safety Glasses, Gloves, Dust Respirator | K = Air Line Hood/Mask, Gloves, Full Suit, Boots |
| F = Safety Glasses, Gloves, Apron, Dust Respirator | X = Ask supervisor for special handling instructions |



Component data taken from Sax's Dangerous properties of Industrial Materials, 10th Edition, John Wiley & Sons; Vendor's MSDS Sheets, NIOSH "Pocket Guide to CHEMICAL HAZARDS", U.S. Department of Health and Human Resources, 2007; The Merck Index, 9th Edition, Merck & Co., Inc.; "ACGIH 2004 TLVs and BEIs", American Conference of Governmental Industrial Hygienists; "Quick Selection Guide to CHEMICAL PROTECTIVE CLOTHING", 3RD Edition, John Wiley & Sons, Inc. ,1997.

Definitions

ACGIH: American Conference of Governmental & Industrial Hygienists
ANSI: American National Standard Institute
BEI: Biological Exposure Indices - individual tests via urine or exhaled air
CERCLA: Comprehensive Emergency Response, Compensation, and Liability Act
DOT: U.S. Department of Transportation
EPA: U.S. Environmental Protection Agency
HMIS: Hazardous Materials Identification System
IARC: International Agency For Research On Cancer
LC₅₀: Lethal Concentration 50: A calculated concentration of the substance which is expected to cause death in 50% of an entire defined experimental animal population.
LCLo: Lethal Concentration Low: The lowest concentration of a material in air (other than LC₅₀) that has been reported to have caused death in humans or animals.
LD₅₀: Lethal Dose 50: A calculated concentration of the substance which is expected to cause death in 50% of an entire defined experimental animal population.
LDLo: Lethal Dose Low: the lowest dose (other than LD₅₀) of a material introduced by any route, other than inhalation, over any given period of time in one or more divided portions and reported to have caused death in humans or animals.
MSHA: Mine Safety and Health Administration
N/A: Not Applicable
N/D: Not Determined
NE: Not Established
NFPA: National Fire Protective Association
NIOSH: National Institute for Occupational Safety & Health
NSF: National Sanitation Foundation
NTP: National Toxicology Program
OSHA: U.S. Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
PPE: Personal Protective Equipment
RCRA: Resource Conservation and Recovery Act
REL: Recommended Exposure Limit (NIOSH)
RQ: Reportable Quantity
SARA: Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA: Self Contained Breathing Apparatus
STEL: Short Term Exposure Limit
TCLo: Toxic Concentration Low: The lowest concentration of a material in air to which humans or animals have been exposed for any given period of time that has produced any toxic effect in humans or produced a carcinogenic, neoplastigenic, or teratogenic effect in animals or humans.
TLV: Threshold Limit Value: A recommended upper limit or TWA concentration of a substance to which most workers can be exposed without adverse effects.
TSCA: Toxic Substances Control Act
TWA: Time Weighted Average
Wt: Weight
<: Less Than
>: Greater Than

DISCLAIMER OF LIABILITY

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Danlin Industries Corporation urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.