Material Safety Data Sheet

Martrex, Inc.

Section 1: Chemical Product and Company Information

Product name: Sulfur Prills
Supplier/Further Information: Martrex, Inc.
P. O. Box 1709
14525 Highway 7
Minnetonka, Minnesota 55345-3793
Phone: 952/933-5000
Toll Free: 800/328-3627
FAX: 952/933-1889
Web: www.martrexinc.com

EPA Registration Number: no data
CAS#: 7704-34-9
Chemical Name: Sulfur, elemental
Synonyms: Flaked Sulfur; Lump Sulfur; Brimstone, Crude Sulfur; Elemental Sulfur; Sulphur; Lump Sulfur; Crushed Sulfur
Chemical Family: Sulfur
MSDS Number: no data

Section 2: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>%</th>
<th>OSHA PEL</th>
<th>OSHA STEL</th>
<th>OSHA TWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur, elemental (grades ↓)</td>
<td>7704-34-9</td>
<td>-</td>
<td>no data</td>
<td>no data</td>
<td>no data</td>
</tr>
<tr>
<td>Prilled, High Purity</td>
<td></td>
<td>99.9% minimum</td>
<td>no data</td>
<td>no data</td>
<td>no data</td>
</tr>
<tr>
<td>Lump or Crude</td>
<td></td>
<td>varies ca. 99%</td>
<td>no data</td>
<td>no data</td>
<td>no data</td>
</tr>
</tbody>
</table>

OTHER LIMITS

<table>
<thead>
<tr>
<th>Component</th>
<th>RTECS#</th>
<th>ACGIH TLV</th>
<th>ACGIH STEL</th>
<th>ACGIH CEIL</th>
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</thead>
<tbody>
<tr>
<td>Sulfur</td>
<td>no data</td>
<td>none established*</td>
<td>no data</td>
<td>no data</td>
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</tbody>
</table>

Mercury Analysis:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>Level Found</th>
<th>Units</th>
<th>Detection Limit</th>
<th>Method</th>
<th>Analysis Date</th>
<th>Verified Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>7439-97-6</td>
<td>not detected</td>
<td>ppm</td>
<td>0.05</td>
<td>EPA 7471</td>
<td>cjym-03/2012</td>
<td>kkh-03/2012</td>
<td>not detected</td>
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</tbody>
</table>

Mercury Analysis by Midwest Laboratories, Inc. Report Number 12-072-2206

*No standards exist for elemental sulfur or bentonite exposure. [Bentonite clays may contain some free silica; the OSHA PEL for silica is 30 mg/m³/((%Si02 + 2 total dust)). OSHA TWA is 0.1mg/m³ *(respirable). The Nuisance Dust Recommendation should govern exposure to solid sulfur and/or sulfur-clay mixtures in the absence of other standards, in the opinion of this writer. For Nuisance Dusts: OSHA = 15 mg/m³ (total) and 5 mg/m³ (as respirable dust); ACGIH = 10 mg/m³ (total dust) or 5 mg/m³ (as respirable dust). Since the combustion of sulfur is not uncommon and since its combustion product in air is SULFUR DIOXIDE, the exposure limits for this gas are shown: Sulfur Dioxide -OSHA=5 ppm TWA*; ACGIH TLV=2 ppm & STEL=5 ppm. [Abbreviations Key: mg/m³ designates milligrams per cubic meter; ppm designates parts per million (volume). ACC designates Acceptable Ceiling Concentration; TWA designates Time Weighted Average; PEL is Permissible Exposure Limit].

Section 3: Hazards Identification

Main hazards: Threshold limit value: none established for sulfur. Sulfur is NOT listed as Carcinogen or Potential Carcinogen under the National Toxicology Program of IARC or OSHA.
**Potential Health Effects:** Prolonged exposure to dust may cause skin dryness, skin and eye irritation, respiratory irritation, or possible dermatitis in sensitive persons. Do not take internally. Avoid breathing dust.

**Primary Routes of Exposure / Entry:** Inhalation (breathing), eye contact, skin contact. **Warning!** May cause central nervous system effects.

**Target Organs:** Central nervous system

**Acute Exposure Symptoms**
- **Inhalation:** May cause respiratory tract irritation.
- **Eye Contact:** May cause eye irritation. May cause lacrimation (tearing), blurred vision, and photophobia. May cause chemical conjunctivitis and corneal damage.
- **Skin Contact:** May cause skin dryness and irritation or possible dermatitis in sensitive persons.

**Chronic Exposure Symptoms:** see section 11 Toxicological Information

**Medical Conditions Aggravated By Long-Term Exposure:** Medical Conditions that may be aggravated by exposure to fumes/hydrogen sulfide/sulfur oxides include respiratory disease or infections; cardiovascular diseases.

### Section 4: First Aid Measures

**Inhalation:** (smoke, Sulfur Dioxide or H₂S): Remove victim to fresh air. Start artificial resuscitation and/or CPR if not breathing. **Call a physician.**

**Eye Exposure:** Flush eyes with water for 15 minutes. Irritation may be delayed several hours; usually disappears soon after exposure ceases. Unless irritation is obviously minor. **Call a physician.** Also see THERMAL BURNS below.

**Skin Exposure:** Wash skin/hair thoroughly with soap and water after use to prevent irritation and transferring material to eyes from fingers/hair. Prolonged contact with skin causes skin dryness. [Has been used as an acne treatment for this reason] Lotions and moisturizers may be useful in prevention. Also see THERMAL BURNS below.

**Ingestion:** If ingested consult a physician. Sulfur is not considered highly toxic. Has been used medically in years past in "laxatives, alterative, antiseptics, antiparasitics" and is a component of animal feeds.

**Thermal Burns:** Flood EYES and/or SKIN with cool water at once! Unless skin burn is obviously minor/superficial; seek medical attention. See that solidified sulfur is carefully and gently removed without tearing flesh. If eyes are involved seek medical attention at once. **NOTE TO THE PHYSICIAN:** Treat symptomatically and supportively.

### Section 5: Fire Fighting Measures

**Flamibility Classification:**
- **NFPA= (estimated) Health: 2; Flammability: 1; Instability: 0**
- **DOT= see Section 14**
- **Flash Point:** 335+F
- **Auto-ignition Temperature (air):** 478-511 degrees F
- **Lower explosion limit (LEL):** Dust 35 g/m³
  - **NOTE:** May vary considerably depending on particle size and dispersion.
- **Upper explosion limit (UEL):** Dust 1400 g/m³
  - **NOTE:** May vary considerably depending on particle size and dispersion.

**Extinguishing Media:** Use water, water fog, dirt, sand, or a carbon dioxide blanket to extinguish a fire. Seal closable tanks to smother a fire. Hi-velocity jets of water or gas should be avoided as these will tend to spread and splash burning material over a larger area. Gentle water sprays or flooding work best. Damage to product can be minimized by smothering (closing off air) or with carbon dioxide flooding.

**Inappropriate Extinguishing Media:** no data

**Unusual Fire and Explosive Hazards:** Combustion product is sulfur dioxide, an irritating toxic gas which smells like burning match heads. Dust air mixtures are highly flammable/explosive. Sulfur fires are deep blue at night, with very short flames. Fire is invisible by daylight except for smoke and heat. Burning material, however, turns a deep red-black.

**Hazardous Decomposition Materials:** no data
**Special Procedures:** Once a fire is controlled, post fire watch for at least 4 hours. Small fires are easy to miss and can linger for hours. Re-ignition may occur.

**Fire-Fighting Instructions:** Protect product and containers from ignition during nearby fires if possible. As a precaution, keep exterior of tanks and bins cool with water spray to help prevent ignition and to help control sulfur fire if ignition occurs. If sulfur ignites: Stay upwind to avoid irritating-toxic sulfur dioxide gas. Protect skin from molten sulfur burns. Indoors, especially, wear self-contained breathing apparatus of the positive pressure type. Protect the eyes. Combustion products (sulfur dioxide) will cause severe coughing/eye & throat pain/and distress. DO NOT INHALE! Avoid raising dust. Once a fire is controlled, post fire watch for at least 4 hours. Small fires are easy to miss and can linger for hours. Re-ignition may occur.

**Personal Protective Equipment:** Protect skin from molten sulfur burns. Indoors, especially, wear self-contained breathing apparatus of the positive pressure type. Protect the eyes. Combustion products (sulfur dioxide) will cause severe coughing/eye & throat pain/and distress.

**CAUTION:** DO NOT INHALE! Avoid raising dust.

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### Section 6: Accidental Release Measures

**Spill and Leak Procedures:** Avoid setting fire to spill material. Have fire fighting media at hand. Avoid creating dust and sparks with tools. Wear eye and face protection, as small brief fires may flare up if a spark is struck.

Small spills may be cleaned up with shovel and broom.

Large spills may be cleaned with front end loaders etc. however, avoid dragging blade on concrete, rocks as this will ignite sparks and potential dust flare-ups. Post fire watch until all danger of fire is past. Personnel should wash thoroughly all exposed skin and hair to prevent irritation from dust.

**Waste Disposal:** Burial, landfill. Local farmers may want to use the material as a plant nutrient or soil amendment provided the only contamination is dirt, and provided they have received competent advice from a soil chemist recommending the application of sulfur and appropriate application rates.

**Environmental and Regulatory Reporting:** In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Follow local/state/national regulations.

**Note:** Local regulations may prescribe or limit action to be taken.

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### Section 7: Handling and Storage

**Handling and Storage:** Handle loose product with well grounded non-sparking process/storage equipment. Dry sulfur materials may generate static electricity and sparking during conveying or grinding. Avoid handling solid sulfur at high velocity in air. Inert gas blanketing is useful in preventing fires and explosions in processing and grinding equipment. Do not use near sparking equipment or open flames. When handling loose, bulk sulfur take special care to prevent steel forks, loader buckets etc. from dragging on rocks or concrete (sparks) and to prevent crushing product with equipment which will create dust. Exclude rocks, sand, loose iron, and other tramp material from entering any augers, elevator parts, or other mechanical handling systems. (Tramp material will cause sparking). Use good housekeeping practice; Do not allow large amounts of waste to accumulate. Enclosed equipment containing dust in air must be adequately explosion-vented or strong enough to withstand the pressures developed in a dust explosion. Do not store near oxidizing materials, or near hot equipment. In the presence of moisture over long periods of time, some sulfur will convert to sulfuric acid which, of course, is corrosive to metals and attacks paper, concrete, wood products, etc. Store product in a dry place.

**Repair & Maintenance Notes:** Be familiar with all information on this sheet and use common sense. Have fire fighting media at hand.

**Vessel Entry:** Isolate vessel from process and heat input. Do not enter hot tanks. If molten sulfur has been generated in the process, be advised that sulfur may remain molten under a crust for a considerable time. Ventilate enclosed tanks with fresh air and purge of all potentially explosive air/dust mixtures before and during entry. Check air in enclosed spaces for flammability and oxygen and suspended dust before entry. If fires have occurred, check for Sulfur Dioxide. Wet down residual sulfur on walls to control dust and fire hazard while cleaning and working. Open-toppered vessels may be swept clean wet or dry with non sparking brooms. Wear dust protection for eyes and breathing, long sleeved shirt/pants. If vessel is not to be re-used at once, rinse and dry thoroughly to limit corrosion.
**Product name:** Sulfur Prills

**Welding, Cutting, Grinding:** Remove bulk sulfur from equipment or wet down thoroughly or blanket with inert gas to prevent ignition. Fully protect material in nearby equipment/containers from sparks or remove it. Eliminate all sources of sulfur dust suspended in air in welding/cutting/grinding area. Wet work is usually preferable. Welding/cutting combustion products will contain sulfur dioxide as well as noxious metal oxides. Do not breathe fumes. Ventilate properly or wear breathing protection suitable for both sulfur dioxide and welding fumes. Posting fire watch during and after such work for 4 hours recommended. For further information see also sections 3, 4, 5, 6, 8 (especially), 10.

**REGULATORY REQUIREMENTS:** See Section 8 for employee exposure controls and Section 15 for other regulatory requirements.

### Section 8: Exposure Controls / Personal Protection

**Ventilation Protection:** The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Indoor use areas should have sufficient local exhaust to remove dust as it is released into the air. Use explosion-proof ventilation equipment.

**Respiratory Protection:** Respiratory protection recommended - dust masks suitable for use with irritating dust.

**Eye Protection:** Eye protection is recommended around dust for personal protection.

**Skin and Body Protection:** Work gloves and long sleeved shirts etc. help keep material off of skin of sensitive persons prone to skin irritation or dermatitis. Use of a good skin moisturizer before and after work helps to avert dry skin problems and discomfort. Be sure to select a skin care product which you are not allergic to. Remember also: fire fighting tools/media should be readily available. (water, dirt, shovels)

**Hygienic Work Practices:** Always observe good personal hygiene measures, such as washing exposed skin and hair thoroughly after use. Launder clothing. If eye irritation occurs, flush eyes with cool clean water. If eye or skin irritation persists, consult a physician. Practice good housekeeping.

**Environmental Controls:** See Sections 6, 7, 12, 13.

### Section 9: Physical and Chemical Properties

**Chemical Name:** Sulfur, elemental

**Physical State:** solid

**Color and Appearance:** Bright yellow flakes, crystals, pastilles, prills, powders or granules. Melted sulfur changes from lemon yellow color to orange to red to black as temperature increases.

**Odor:** very slight - sweet to mercaptany. A strong “sulfuric” odor is present in liquid state.

**Odor Threshold:** no data

**pH (in water):** no data

**Specific Gravity (at room temperature):** 2.07

**Vapor Pressure (at 140°F):** 1.15 x 10^-4 mm Hg

**Vapor Density (at boiling point):** 0.2278 pounds/cubic foot. >1 (air=1)

**Relative Density:** no data

**Density (@15°C):** no data

**Flash Point:** 335°F

**Auto-ignition Temperature (air):** 478-511 degrees F

**Lower explosion limit (LEL):** Dust 35 g/m³

**Upper explosion limit (UEL):** Dust 1400 g/m³

**Volatiles by Volume @ 21°C:** 0

**Boiling Point:** 832.3 degrees F at one atmosphere pressure

**Softening Point:** no data

**Melting Point:** 231 - 246 Degrees F depending on temperature history

**Evaporation Rate:** <<1 (ether=1)

**Solubility in water:** nil

**Other Solubilities:** no data

**Viscosity:** Viscosity of molten sulfur increases rapidly with temperature and then falls back off with further temperature increase.

**Coefficient of Thermal Expansion:** no data

**Chemical Formula:** S₈
Molecular Weight: 256.53

Section 10: Stability and Reactivity

Chemical Stability: Stable X Unstable ___ Material is stable under normal conditions.

*Elemental sulfur is stable by itself at ambient temperatures.

Conditions to Avoid: mixtures of air and sulfur dust, sparks or open flames, mixtures of sulfur and oxidizing agents (other than sulfur) in general, large accumulations of sulfur dust which could become airborne in an explosion or process disruption caused by other materials. Examples of common oxidizing agents are PERCHLORATES, NITRATES, CHLORATES, PERMANGANATES, PEROXIDES, OXYGEN, HALOGENS, etc. Good housekeeping is important to minimize fire danger.

General Information: Solid sulfur is satisfactorily compatible with common materials of construction including steel and aluminum. Molten sulfur may attack and degrade rubber and some plastics. At still higher temperatures sulfur will react with hydrocarbons evolving poisonous hydrogen sulfide gas in the absence of air. The gas is also flammable. Sulfur is both an OXIDIZING AGENT and a REDUCING AGENT. Sulfur will form sulfides with most metals, including iron, and reacts vigorously with metals in the Sodium and Magnesium groups on the periodic table. Sulfides of iron will oxidize fairly rapidly in moist air. In the presence of other readily oxidized combustibles (such as some oily materials) under certain conditions, the heat liberated may be sufficient to result in spontaneous ignition. This phenomenon has not been observed with these pure Sulfur products or Disintegrating Sulfur in contact with unprotected steel at ordinary ambient temperatures, however. Users are cautioned against allowing inadvertent mixtures of sulfur, iron, and miscellaneous oils to remain. Oxidation is accelerated by higher temperatures. Heat buildup and ignition can be prevented by keeping the sulfides wet until oxidation is complete. The literature on sulfur is extensive. Consult a chemist before compounding.

Hazardous Decomposition Products: Sulfur dioxide gas is poisonous, irritating and a choking gas. It smells like burning match heads (which also liberate Sulfur dioxide). Do not inhale! If exposed get to fresh air at once. Treat over-exposure same as for smoke inhalation.

Section 11: Toxicological Information

Potential Chronic Health Effects

<table>
<thead>
<tr>
<th>Component</th>
<th>Results</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur</td>
<td>Sub-chronic LD&lt;sub&gt;10&lt;/sub&gt; Oral</td>
<td>Rat - Male, Female</td>
<td>1000 mg/kg</td>
<td>90 days; 7 days per week</td>
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<tr>
<td></td>
<td>Sub-chronic LD&lt;sub&gt;10&lt;/sub&gt; Dermal</td>
<td>Rat - Male, Female</td>
<td>400 mg/kg</td>
<td>6 hours; 7 days per week</td>
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</table>

Conclusion/Summary: Not available

LD<sub>50</sub>/LC<sub>50</sub>: No information found concerning routes of occupational exposure. Irritation: eye human: 8 ppm.

General: No known significant effects or critical hazards.

Carcinogenicity: Sulfur is NOT listed as Carcinogen or Potential Carcinogen under the National Toxicology Program of IARC or OSHA.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental Effects: No known significant effects or critical hazards.

Fertility Effects: No known significant effects or critical hazards.

Other Information: Not available.

Section 12: Ecological Information

12.1 Toxicity:

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<tr>
<th>Component</th>
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<th>Species</th>
<th>Exposure</th>
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<tbody>
<tr>
<td>Sulfur</td>
<td>Acute EC&lt;sub&gt;50&lt;/sub&gt;&gt;5000 ppm Fresh water</td>
<td>Daphnia-Daphnia magna&lt;24 hours</td>
<td>48 hours</td>
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<td></td>
<td>Acute LC&lt;sub&gt;50&lt;/sub&gt;&lt;14 ppm Fresh water</td>
<td>Fish - Lepomis macrochirus</td>
<td>96 hours</td>
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Conclusion/Summary: Not available
12.2 Persistence and Degradability:

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<tr>
<th>Component</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
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</thead>
<tbody>
<tr>
<td>Sulfur</td>
<td>-</td>
<td>-</td>
<td>Not readily</td>
</tr>
</tbody>
</table>

Conclusion/Summary: Not available

12.3 Bio-accumulative potential
Not Available

12.4 Mobility in soil

**Soil / water partition coefficient (Koc):** Not available

**Mobility:** Not available

12.5 Results of PBT and vPvB assessment

- **PBT:** Not applicable
  - **P:** Not available. **B:** Not available. **T:** Not available.
- **vPvB:** Not applicable
  - **vP:** Not available. **vB:** Not available.

12.6 Other adverse effects: No known significant effects or critical hazards.

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### Section 13: Disposal Considerations

**Disposal recommendations** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**Waste Disposal:** Burial, landfill. Local farmers may want to use the material as a plant nutrient or soil amendment provided the only contamination is dirt, and provided they have received competent advice from a soil chemist recommending the application of sulfur and appropriate application rates.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

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### Section 14: Transport Information


**DOT Hazard Class:** Class 9, Miscellaneous Dangerous Substance for bulk packaged Elemental Sulfur, Flaked Sulfur and Ground Sulfur.

**DOT #:** NA1350

**DOT LABELS:** NONE REQUIRED (with the exception of Bulk Packaged Elemental Sulfur, Flaked Sulfur and Ground Sulfur) per [49 CFR § 172.102(c)(1) Code/Special Provision 30]. CLASS 9 for Bulk Packaged Bulk Packaged Elemental Sulfur, Flaked Sulfur and Ground Sulfur.

**EPA TOSCA & CAS#:** 7704-34-9

**DOC Schedule B No:** 2503.10.0000 Ck Dgt 6

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### Section 15: Regulatory Information

**US FEDERAL**

- **TSCA:** CAS# 7704-34-9 is listed on the TSCA inventory.
- **Health & Safety Reporting List:** None of the chemicals are on the Health & Safety Reporting List.
- **Chemical Test Rules:** None of the chemicals in this product are under a Chemical Test Rule.
- **Section 12b:** None of the chemicals are listed under TSCA Section 12b.
- **TSCA Significant New Use Rule:** None of the chemicals in this material have a SNUR under TSCA.

**SARA**

- **Section 302 (RQ):** None of the chemicals in this material have an RQ.
- **Section 302 (TPQ):** None of the chemicals in this product have a TPQ.

**SARA Codes:** CAS # 7704-34-9: acute, chronic, flammable.
Section 313: No chemicals are reportable under Section 313.

Clean Air Act: This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.

STATE: CAS# 7704-34-9 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Massachusetts. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols: XI
Risk Phrases: R 36 Irritating to eyes.
Safety Phrases: 
WGK (Water Danger/Protection): CAS# 7704-34-9: 1

Canada

DSL List: CAS# 7704-34-9 is listed on Canada's DSL List. CAS# 7704-34-9 is listed on Canada's DSL List.

WHMIS: This product has a WHMIS classification of B4, D2B.

Canada's Ingredient Disclosure List: CAS# 7704-34-9 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

Section 16: Other Information

ACGIH - American Conference of Governmental Industrial Hygienists
ANSI - American National Standards Institute
CAS - Chemical Abstracts Service
CERCLA - Comprehensive Environmental Response, Compensation & Liability Act of 1980
CFR - Code of Federal Regulations
CHEMTREC - Chemical Transportation Emergency Center
DOT - U.S. Department of Transportation
DSL - Canadian Domestic Substance List
EHS - Extremely Hazardous Substance
EPA - U.S. Environmental Protection Agency
HMIS - Hazardous Material Identification System
IARC - International Agency for Research on Cancer
LC50 - The lowest concentration (vapors, dusts, mists) reported to cause the death of animals or humans.
LC50 - The concentration (vapors, dusts, mists) which kills half of test animals under controlled conditions.
LD50 - The lowest concentration of material (solids and liquids) reported to cause the death of animals or humans.
LD50 - The concentration (solids and liquids) which kills half of test animals under controlled conditions.
LEL/UEL - Lower and Upper Explosive Limit

NFPA Rating Explanation Guide

<table>
<thead>
<tr>
<th>Rating Number</th>
<th>Health Hazard</th>
<th>Flammability Hazard</th>
<th>Instability Hazard</th>
<th>Rating Symbol</th>
<th>Special Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Can be lethal</td>
<td>Will vaporize and readily burn at normal temperatures</td>
<td>May explode at high temperatures and pressures</td>
<td>ALK</td>
<td>Alkaline</td>
</tr>
<tr>
<td>3</td>
<td>Can cause serious or permanent injury</td>
<td>Can be ignited under almost all ambient temperatures</td>
<td>May explode at high temperature or shock</td>
<td>ACID</td>
<td>Acidic</td>
</tr>
<tr>
<td>2</td>
<td>Can cause temporary incapacitation or residual injury</td>
<td>Must be heated to high temperature to burn</td>
<td>Violent chemical change at high temperatures or pressures</td>
<td>BIO</td>
<td>BioHazard</td>
</tr>
<tr>
<td>1</td>
<td>Can cause significant irritation</td>
<td>Must be preheated before ignition can occur</td>
<td>Normally stable, High temperatures make unstable</td>
<td>COR</td>
<td>Strong Corrosive</td>
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<tr>
<td>0</td>
<td>No Hazard</td>
<td>Will not burn</td>
<td>Stable</td>
<td>CRYO</td>
<td>Cryogenic</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>OXY</td>
<td>Oxidizer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactive</td>
<td>Reacts violently or explosively with water</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W</td>
<td>Reacts violently or explosively with water or oxidizer</td>
</tr>
</tbody>
</table>

24 Hour Emergency Phone - Chemtrec: 1-800-424-9300  Transportation 1-800-441-3637 Medical
mg/m³ - Milligrams per cubic meter
MSDS - Material Safety Data Sheet
NAERG - North American Emergency Response Guidebook
NIOSH - National Institute of Occupational Safety and Health
NFPA - National Fire Protection Association
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - Permissible Exposure Limit (set by OSHA)
PPE - Personal Protective Equipment
RCRA - Resource Conservation and Recovery Act of 1976
SARA - Superfund Amendments and Reauthorization Act
TDG (Canadian): Transport of Dangerous Goods Regulations
TLV - Threshold Limit Value (set by ACGIH)
TWA - 8-hour Time Weighted Average
TSCA - US Toxic Substance Control Act
WHMIS - Workplace Hazardous Material Information System

MSDS Issue Date: n/a
Revised Date: 6-7-2012
Supersedes: 9-29-2010

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