

## MATERIAL SAFETY DATA SHEET

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

#### 1. PRODUCT IDENTIFICATION

|                                      |  |
|--------------------------------------|--|
| <u>TRADE NAME (AS LABELED):</u>      | Popcorn Texture  |
| <u>PRODUCT CODE:</u>                 | 4099, 4099-06, 4099-10-06  |
| <u>PRODUCT USE:</u>                  | Ceiling Texture  |
| <u>SUPPLIER/MANUFACTURER'S NAME:</u> | HOMAX PRODUCTS, INC.   |
| <u>ADDRESS:</u>                      | 200 WESTERLY ROAD<br>BELLINGHAM, WA 98226                                |
| <u>CHEMTREC EMERGENCY NO.:</u>       | 1-800-424-9300 (United States)<br>1-703-527-3887 (International Collect) |
| <u>BUSINESS PHONE:</u>               | 1-800-729-9029   |
| <u>DATE OF PREPARATION:</u>          | January, 2008  |

#### 2. COMPOSITION and INFORMATION ON INGREDIENTS

| CHEMICAL NAME   | CAS #      | % w/w   | EXPOSURE LIMITS IN AIR  |                           |  |                           |                   |   |
|---|------------|---------|---|---------------------------|--|---------------------------|-------------------|---|
|   |            |         | ACGIH-TLV   |                           | OSHA-PEL                                   |                           | NIOSH IDLH        | OTHER   |
|   |            |         | TWA<br>mg/m <sup>3</sup>  | STEL<br>mg/m <sup>3</sup> | TWA<br>mg/m <sup>3</sup>                   | STEL<br>mg/m <sup>3</sup> | mg/m <sup>3</sup> |   |
| Titanium dioxide  | 13463-67-7 | 10 - 15 | 10  | NE                        | 15<br>(total dust)                         | NE                        | NE                | NIOSH REL: NE<br>DFG MAK:<br>1.5 mg/m <sup>3</sup>          |
| Calcium carbonate   | 1317-65-3  | 10 - 15 | 10  | NE                        | 15 (total dust)<br>5 (respirable fraction) | NE                        | NE                | NIOSH REL:<br>10 (total dust)<br>5 (respirable fraction)    |
| Perlite   | 93763-70-3 | 10 - 15 | 10  | NE                        | 15 (total dust)<br>5 (respirable fraction) | NE                        | NE                | NIOSH REL:<br>10 (total dust)<br>5 (respirable fraction)    |
| Dimethyl ether<br>(PROPELLANT)  | 115-10-6   | 5 - 10  | NE  | NE                        | NE   | NE                        | NE                | DFG MAK:<br>1900mg/m <sup>3</sup> (1000 ppm)<br>Peak II (8) |
| Water and ingredients present in concentrations of less than 1% (or less than 0.1% if carcinogens). |            | Balance | The ingredients in the balance of this product do not contribute significant hazards beyond those described in this document. All pertinent health, safety and environmental information have been presented, per the requirements of the US Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and Canadian WHMIS. ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. |                           |  |                           |                   |   |

NE = Not Established. See Section 16 for Definitions of Terms Used.

### 3. HAZARD IDENTIFICATION

#### EMERGENCY OVERVIEW:

**PHYSICAL DESCRIPTION:** This product is a grayish white liquid with an ether odor.

**HEALTH HAZARD:** This product may cause mild irritation to the eyes or skin. If particulates of this product are inhaled, mild irritation of the nose or throat could occur.

**FIRE HAZARD:** This product contains Dimethyl ether, a flammable gas.

**REACTIVITY HAZARD:** Minimal Hazard; the product is normally stable under ordinary conditions of use and storage.

**ENVIRONMENTAL HAZARD:** This product does not normally present a significant hazard to aquatic or terrestrial life.

#### SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:

The most significant route of occupational overexposure is contact with skin and eyes. The symptoms of overexposure to this product are as follows:

**INHALATION:** If inhalation of material's mists or vapors occurs, mild respiratory system irritation may develop. Symptoms of respiratory exposure can include coughing, sneezing, shortness of breath, and nasal discomfort. Dimethyl ether has a narcotic effect and can depress central nervous system function, resulting in headache, dizziness, giddiness, intellectual impairment and unconsciousness. Dimethyl ether can cause cardiovascular symptoms such as irregular heartbeat. Acute symptoms are generally alleviated when overexposure ends.

**CONTACT WITH SKIN or EYES:** Contact can cause mild eye or skin irritation. Symptoms of eye exposure may include redness, pain, and tearing. Prolonged skin contact may result in redness, irritation, and dermatitis.

**SKIN ABSORPTION:** No component of this product is reported to be absorbed through intact skin.

**INGESTION:** Ingestion is not anticipated to be a significant route of occupational exposure. If the product is swallowed, mild irritation of the mouth, throat, and other tissues of the gastro-intestinal system may occur. Ingestion of large amounts may cause irritation, pain, vomiting, and diarrhea.

**INJECTION:** Accidental injection of this product may cause mild irritation and swelling, in addition to the wound.

#### Hazardous Materials Identification System (HMIS)

|                      |     |
|----------------------|-----|
| Health               | 1 * |
| Flammability         | 4   |
| Physical Hazard      | 1   |
| Protective Equipment | A   |

See Section 16 for Definition of Ratings

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

**ACUTE:** Depending on the duration of contact, overexposures can mildly irritate the eyes, skin, mucous membranes, and any other exposed tissue. Symptoms of exposure generally alleviated when overexposure ends.

**CHRONIC:** Long-term skin contact may result in dermatitis.

**TARGET ORGANS:** Acute: Eyes, skin. Chronic: Eyes, skin.

---

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

---

### 4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Take a copy of label and MSDS to physician or health professional with victim.

**SKIN EXPOSURE:** If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention if any adverse exposure symptoms develop.

**EYE EXPOSURE:** If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

**INHALATION:** If this product is inhaled, blow nose and remove victim to fresh air.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth with water, if

conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin disorders or eye conditions may be aggravated by exposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

---

## 5. FIRE-FIGHTING MEASURES

FLASH POINT: 29°F (-1.6°C)

AUTOIGNITION TEMPERATURE: 662°F (350°C) (Dimethyl ether propellant)

FLAMMABLE LIMITS (in air by volume, %):

Lower: 3.4% (Dimethyl ether propellant)

Upper: 27% (Dimethyl ether propellant)

FIRE EXTINGUISHING MATERIALS: Use extinguishing material suitable to the surrounding fire.

Water Spray: OK.

Carbon Dioxide: OK

Foam: OK

Dry Chemical: OK

Halon: OK

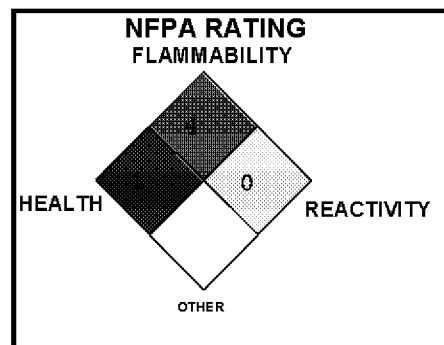
Other: Any "ABC" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may decompose and, generating dusts, irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide).

Explosion Sensitivity to Mechanical Impact: Not sensitive under normal conditions.

Explosion Sensitivity to Static Discharge: Not sensitive under normal conditions.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. Exercise caution; contaminated floors and surfaces can be sticky. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.



See Section 16 for Definition of Ratings

---

## 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 and protect people. Releases of this material may be sticky. If the product is dried, and dusts may be generated during clean-up, dampen material prior to clean-up to avoid airborne particulates.

RESPONSE TO INCIDENTAL RELEASES: Small scale releases, such as 1 container of this product, can generally be handled by personnel who have received basic chemical safety training. Respond to incidental chemical releases by wearing gloves, goggles, and appropriate body protection and by following the instructions for use presented above.

RESPONSE TO NON-INCIDENTAL RELEASES: Respond to non-incident chemical releases of this product, such as the simultaneous puncturing of several containers, by clearing the impacted area and contacting appropriate emergency personnel. Clean up should only be done by qualified personnel. Responders should wear the level of protection appropriate to the type of chemical released, the volume of the material spilled, and the location where the incident has occurred. Minimum Personal Protective Equipment should be Level C: triple-gloves, chemical resistant apron, boots, and splash goggles and an Air-Purifying respirator with high-efficiency particulate filter.

RESPONSE EQUIPMENT AND PROCEDURES: Wipe-away spilled paste with damp polypads or other suitable absorbent materials, or scrape carefully with plastic tools. Decontaminate the area thoroughly. Place all spill residues in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (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. Wash thoroughly after using this product. Do not eat or drink while using this material. Avoid generating dusts and particulates of this product. If sanding, use with adequate ventilation. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to use it safely. Open containers carefully on a stable surface. Empty containers may contain residual material; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep

container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

---

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure adequate ventilation is available when sanding. Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: None needed under normal conditions of use. Use a dust respirator for large jobs if dusts cannot otherwise be eliminated.

EYE PROTECTION: For consumer use, wearing eye protection (such as splash goggles) is advisable. However, for specific industrial applications, enhanced eye protection may be necessary. Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian standards.

HAND PROTECTION: For consumer use, wearing protective gloves is recommended. For specific industrial applications, wear chemical impervious gloves (e.g., Neoprene, nitrile). If necessary, refer to U.S. OSHA 29 CFR 1910.138 or the appropriate standards of Canada.

BODY PROTECTION: For consumer use, no specific body protection is normally needed. For specific industrial applications, body protection is not routinely necessary, but may be warranted if excessive dusts may be generated. Use body protection appropriate for task (e.g., Tyvek suit, rubber apron). If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

HMS PERSONAL PROTECTIVE EQUIPMENT RATING: Industrial Use situations: A (gloves, safety glasses)

---

## 9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): > 1

EVAPORATION RATE (BuAc = 1): < 1

SPECIFIC GRAVITY: 0.939

MELTING/FREEZING POINT: Not applicable - slurry.

SOLUBILITY IN WATER: Not applicable - slurry.

BOILING POINT: Not applicable - slurry.

VAPOR PRESSURE: 62.3 psig (Dimethyl ether propellant)

pH: 8.5 - 9

ODOR THRESHOLD: Not available.

COATING V.O.C.: 9.7%

MIR: < 1.20

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not available.

APPEARANCE, ODOR AND COLOR: Grayish white liquid with an ether odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance and odor of this product may act as warning properties in the event of an accidental release.

---

## 10. STABILITY and REACTIVITY

STABILITY: Stable under normal circumstances of use and handling.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate dusts, irritating fumes, and toxic gases (e.g., carbon monoxide, carbon dioxide).

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is not compatible with strong bases, strong acids, and powerful oxidizers.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

---

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

---

### **11. TOXICOLOGICAL INFORMATION**

TOXICITY DATA: The following toxicology information is available for components greater than 1% in concentration.

The following data are available for Calcium carbonate:

Oral - Rat: LD<sub>50</sub>: 6450 mg/kg

The following data are available for Dimethyl ether:

Inhalation-Rat LC<sub>50</sub>: 308 g/m<sup>3</sup>

Inhalation-Mouse LC<sub>50</sub>: 386,000 ppm/30M

Inhalation-Rat TCL<sub>0</sub>: 2 pph/6H/30W-I

The following data are available for Perlite:

Oral-Mouse: LD<sub>50</sub>: 13.0 g/kg (13000 mg/kg)

Standard Animal toxicology data are not available for Titanium dioxide or Attapulgit.

SUSPECTED CANCER AGENT: The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.

| CHEMICAL          | IARC | NTP | NIOSH | OSHA | CA Prop. 65 |
|-------------------|------|-----|-------|------|-------------|
| Titanium dioxide  | NO   | NO  | NO    | NO   | NO          |
| Calcium carbonate | NO   | NO  | NO    | NO   | NO          |
| Perlite           | NO   | NO  | NO    | NO   | NO          |
| Dimethyl ether    | NO   | NO  | NO    | NO   | NO          |

IRRITANCY OF PRODUCT: This product can be mildly irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: The components of this product are not reported to be sensitizers.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: Dimethyl ether, the propellant, may increase susceptibility to cardiac arrhythmias for patients being treated with epinephrine.

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

Mutagenicity: This product is not expected to produce mutagenic effects in humans when used as instructed.

Embryotoxicity: This product is not expected to produce embryotoxic effects in humans when used as instructed.

Teratogenicity: This product is not reported to cause teratogenic effects in humans when used as instructed.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans when used as instructed.

*A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that 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 that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.*

BIOLOGICAL EXPOSURES INDICES (BEIs): There currently is no BEI established for any component of this product.

---

### **12. ECOLOGICAL INFORMATION**

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The following environmental data is available for components of this product: The mineral components of this product are stable in the environment.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product is not anticipated to cause significant effects on terrestrial plants or animals if released in small, consumer-sized volumes. This product may be harmful to animal life if large volumes of it are released into the environment. Refer to Section 11 (Toxicological Information) for specific animal data.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product is not anticipated to cause significant effects on aquatic plants or animals if released in small, consumer-sized volumes. This product may be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment).

---

### 13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Consumer Waste: Dispose of according to pertinent state and local household waste and requirements. Industrial Use: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada.

EPA WASTE NUMBER: Not applicable to wastes consisting only of this product; however, the specific RCRA codes depend on the exact nature of the discarded material.

---

### 14. TRANSPORTATION INFORMATION

THIS PRODUCT IS HAZARDOUS PER 49 CFR 172.101, THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Aerosols  
HAZARD CLASS NUMBER and DESCRIPTION: 2.1 (Flammable Gas)  
UN IDENTIFICATION NUMBER: UN1950  
DOT LABEL(S) REQUIRED: Flammable Gas  
PACKAGING GROUP: Not applicable.  
NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (2000): 126  
MARINE POLLUTANT: No component is designated as a DOT Marine Pollutant.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: The above-listed DOT basic description applies to this product under the regulations of Transport Canada.

Consumer commodities (per 173.306 (h)): A limited quantity that conforms to the provisions of paragraph (a) (1), (a) (3), or (b) of this section and is a "consumer commodity" (per 49 CFR 171.8) can be renamed "Consumer commodity" and reclassified as an ORM-D Material. Each package may not exceed 30 kg (66 pounds) gross weight. Reference 173.306 (a) (3): Limited quantities of compressed gases may be shipped when in a metal container for the sole purpose of expelling a nonpoisonous liquid, paste, or powder.

---

### 15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

EPA REPORTING REQUIREMENTS: The following reporting requirements are applicable to components of this product:

| CHEMICAL          | SECTION 302<br>(40 CFR 355, Appendix A) | SECTION 304<br>(40 CFR Table 302.4) | SECTION 313<br>(40 CFR 372.65) |
|-------------------|---|-------------------------------------|--------------------------------|
| Titanium dioxide  | NO                                      | NO                                  | NO                             |
| Calcium carbonate | NO                                      | NO                                  | NO                             |
| Perlite           | NO                                      | NO                                  | NO                             |
| Dimethyl ether    | NO                                      | NO                                  | NO                             |

U.S. SARA SECTION 311/312 FOR PRODUCT: Acute health effects; chronic health effects, flammable.

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

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This product may contain a trace amount of crystalline silica as a contaminant from other ingredients.

ANSI LABELING (Z129.1):

DANGER! FLAMMABLE VAPOR. VAPOR HARMFUL. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL. CONTENTS UNDER PRESSURE. MAY EXPLODE IF HEATED.

ANSI LABEL PRECAUTIONS:

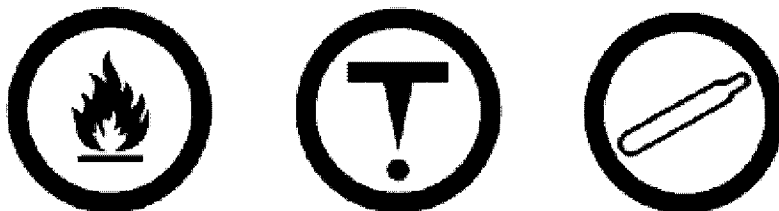
Keep away from heat, sparks and flame. Do not expose to heat or store at temperatures above 120°F. Close container after use. Avoid breathing dust, vapors or mist. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

**ENVIRONMENTAL HAZARDS:** Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

**ADDITIONAL CANADIAN REGULATIONS:**

**CANADIAN DSL/NDL INVENTORY STATUS:** The components of this product are listed on the DSL Inventory.

**CANADIAN WHMIS SYMBOLS:** A - Compressed Gas  
B1 - Flammable gases  
D2B - Poisonous and infectious material - Other effects - Toxic



This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

---

## 16. OTHER INFORMATION

**Disclaimer:** As the handling and use of products under user's conditions are beyond our control, no warranty, expressed or implied, including, but not limited to merchantability or fitness for a particular use, is made concerning this product. The user assumes all risk of use or handling whether or not in accordance with any directions or suggestions of the supplier. Seller shall not be liable to purchaser or any other person for loss or damages directly or indirectly arising from the use of our products, from breach of any warranty or from any other cause, the exclusive remedy against the seller being to require replacement or repair of defective goods.

### 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 that uniquely identifies each compound.

**ACGIH - American Conference of Governmental Industrial Hygienists,** a professional association which establishes exposure limits.

**TLV - Threshold Limit Value -** an airborne concentration of a substance that 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 (C). Skin absorption 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 that 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.

**HAZARD RATINGS:**

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:** Health Hazard: 0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can cause

permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids, liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

**NATIONAL FIRE PROTECTION ASSOCIATION:** Health Hazard: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

#### FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. 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: LD<sub>50</sub> - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC<sub>50</sub> - 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/m<sup>3</sup> 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. Other measures of toxicity include TDL<sub>0</sub>, the lowest dose to cause a symptom and TCL<sub>0</sub> the lowest concentration to cause a symptom; TDo, LDLo, LD<sub>01</sub>, TC, TC<sub>01</sub>, LCLo, and LCo, the lowest dose (or concentration) to cause lethal or toxic effects. 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. Ecological Information: EC is the effect concentration in water.

Data from several sources are used to evaluate the cancer-causing potential of the material. The sources and ratings are: IARC - the International Agency for Research on Cancer; 1 = Carcinogenic to humans, 2A, 2B = Probably carcinogenic to humans, 3 = Unclassifiable as to carcinogenicity in humans, and 4 = Probably not carcinogenic to humans. NTP - the National Toxicology Program; K = Known to be a human carcinogen, and R = Reasonably anticipated to be a human carcinogen. RTECS - the Registry of Toxic Effects of Chemical Substances. OSHA - Occupational Safety and Health Administration and CAL/OSHA - California's subunit of the Occupational Safety and Health Administration; Ca = Carcinogen defined with no further categorization. ACGIH - American Conference of Governmental Industrial Hygienists; A1 = Confirmed human carcinogen, A2 = Suspected human carcinogen, A3 = Confirmed animal carcinogen with unknown relevance to humans, A4 = Not classifiable as a human carcinogen, and A5 = Not suspected as a human carcinogen. NIOSH - U.S. National Institute for Occupational Safety and Health; Ca = Potential occupational carcinogen, with no further categorization. EPA - U.S. Environmental Protection; A = Human carcinogen, B = Probable human carcinogen, C = Possible human carcinogen, D = Not classifiable as to human carcinogenicity, E = Evidence of Non-carcinogenicity for humans, K = Known human carcinogen, L = Likely to produce cancer in humans, CBD = Cannot be determined, NL = Not likely to be carcinogenic in humans, and I = Data are inadequate for an assessment of human carcinogenic potential.

#### 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. Superfund Amendments and Reauthorization Act (SARA); the Canadian Domestic/Non-Domestic Substances List (DSL/NDL); the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); and various state regulations. This section also includes information on the precautionary warnings that appear on a material's industrial package label.