MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION of the SUBSTANCE or PREPARATION

IDENTIFICATION OF THE SUBSTANCE:

Trade/Material Name: **VIOLA™**
Chemical Names, Common Names: Corn Oil
Synonyms: Maise Oil; Maydol; Mazola Oil; Oils, Corn; Zea Mays Kernel Extract
Molecular Formula: Variable
Product Use: Various

COMPANY/UNDERTAKING IDENTIFICATION:

U.S. Manufacturer's/Distributor's Name: **POET Nutrition**
Address: 4506 N Lewis Ave.
Sioux Falls SD 57104
Business Phone: From U.S./Canada: 1-888-327-8799 (8am-5pm CST)
From Outside U.S./Canada:
Business Fax: 1-605-332-2266
Emergency Phone: Infotrac: 1-800-535-5053 (U.S., Canada and Puerto Rico) [24 hours]
Infotrac: 1-352-323-3500 (Outside North America) [24-hours]
Email Address for Product Information: info@dakotagold.com

ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 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. The product is also classified per all applicable EU Directives through EC 1907: 2006, the European Union CLP EC 1272/2008 and the Global Harmonization Standard.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION and EU CLP REGULATION (EC) 1272/2008 LABELING and CLASSIFICATION: This product has been classified as per criteria of the Global Harmonization Standard and the CLP Regulation (EC) 1272/2008.

Classification: Not Applicable Signal Word: Not Applicable Hazard Statement Codes: Not Applicable
Precautionary Statement Codes: Not Applicable Hazard Symbols/Pictograms: Not Applicable

EU LABELING AND CLASSIFICATION 67/548/EEC: This product has been classified as per criteria of the European Community Council Directive 67/548/EEC or subsequent Directives.

Classification: Not Applicable Risk Phrases: Not Applicable Safety Phrases: Not Applicable
Hazard Symbol: Not Applicable

EMERGENCY OVERVIEW: Product Description: This product is a light, reddish-orange liquid, with an odor characteristic of corn. **Health Hazards:** Under normal circumstance of handling and use, this product presents minimal hazards by all routes of exposure. Can cause skin irritation if contact is prolonged. Ingestion of large quantities may cause digestive up-set. Inhalation of mists or sprays may be irritating. Aspiration into the lungs may cause oil-induced pneumonia or hazardous respiratory edema. Corn Oil has been reported to cause sensitization and allergic skin reaction in susceptible individuals. **Flammability Hazards:** This product is combustible; it must be highly heated in order to ignite. If involved in a fire it will release irritating carbon oxides and may produce heavy smoke. Dangerous spontaneous heating may occur during storage if leaks impregnate rags, waste, etc. **Reactivity Hazards:** This product is not reactive. **Environmental Hazards:** Negligible. **Emergency Response Procedures:** Emergency responders must wear adequate personal protective equipment and provide suitable fire protection during response situations.

3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS#	WT%	EU Classification (67/548/EEC) GHS & EU Classification (1272/2008 EC) Risk Phrases/Hazard Statements
Corn Oil	8001-30-7	232-281-2	100%	EU 67/548: Classification: Not Applicable Risk Phrases: Not Applicable Safety Phrases: Not Applicable Hazard Symbol: Not Applicable GHS & EU 1272/2008: Classification: Not Applicable Signal Word: Not Applicable Hazard Statement Codes: Not Applicable Precautionary Statement Codes: Not Applicable Hazard Symbols/Pictograms: Not Applicable

See Section 16 for full text of Ingredient Risk & Safety Phrases and Precautionary Statements

4. FIRST-AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: See Sections 6 (Accidental Release Measures) and 8 (Exposure Controls-Personal Protection). Rescuers should be taken for medical attention, if necessary.

DESCRIPTION OF FIRST AID MEASURES: RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS MATERIAL WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant clothing must be worn. Adequate fire protection must be provided during rescue situations. Victim(s) must be taken for medical attention. Take copy of label and MSDS to physician or other health professional with victim(s). Remove victim(s) to fresh air, as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.

Skin Exposure: If this product contaminates the skin and adverse effect occurs, decontaminate with running water. Minimum flushing is for 20 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention if adverse effect occurs after flushing.

Eye Exposure: If vapors or liquid from this product enter 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 20 minutes. Victim must seek medical attention if any adverse effect occurs after flushing.

Inhalation: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect occurs after removal to fresh air.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directly by medical personnel. Have victim rinse mouth with water or give several cupfuls of water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.

MOST IMPORTANT SYMPTOMS/EFFECTS (ACUTE & CHRONIC): See Sections 2 (Hazard Identification) and 11 (Toxicological Information) for description of possible health effects from exposure to this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate overexposure. See above for more specific information.

5. FIRE-FIGHTING MEASURES

FLASH POINT (closed cup): ≥ 250°C (≥ 482°F)

AUTOIGNITION TEMPERATURE: ≥ 390°C (≥ 734°F)

FLAMMABLE LIMITS (in air by volume, %): Not available.

FIRE EXTINGUISHING MEDIA: Fire extinguishing materials that can be used against fires of this product include carbon dioxide, dry chemical powder, halon, 'ABC' Class, or appropriate foam. Water should not be used in jets as it may spread burning oil.

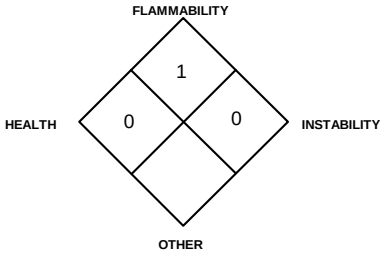
UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

SPECIAL FIRE AND EXPLOSION HAZARDS: This product is a combustible liquid. When involved in a fire, this material may ignite and produce irritating vapors and toxic gases (e.g., carbon oxides). Dangerous spontaneous heating may occur during storage if leaks impregnate rags, waste, etc.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Static discharge may cause this material to ignite.

NFPA RATING



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

ADVICE TO FIRE-FIGHTERS: 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. Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained firefighters to disperse this product's vapors and to protect personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly with soapy water before returning such equipment to service.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES: Eliminate any possible source of ignition and provide maximum explosion-proof ventilation. Proper protective equipment, including fire protection, should be used in the event of a large release. Use only non-sparking tools. The atmosphere must have at least 19.5 percent oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection. Spills may be very slippery and can present a serious slip-hazard.

PROTECTIVE EQUIPMENT:

Small Spills: For incidental spills (e.g., 1 pint), wear lightweight gloves, a lab coat, and eye protection.

Large Spills: For large spills (e.g., 5 gallons or more), protective apparel should be Level C: triple-gloves (rubber gloves and nitrile gloves over latex gloves), boots, hardhat, and Air-Purifying respirator with organic vapor cartridge. Self-Contained Breathing Apparatus must be selected if release occurs in confined or poorly ventilated areas or in situations in which the level of oxygen is below 19.5%.

6. ACCIDENTAL RELEASE MEASURES (Continued)

METHODS FOR CLEAN-UP AND CONTAINMENT:

Small Spills: Absorb spilled product with polypad or other non-reactive sorbent. Shovel up spill and absorbent material and place in appropriate container for disposal.

Large Spills: Absorb spilled product with polypads, clay or other suitable absorbent materials. Dike or otherwise contain spill and remove with vacuum truck or pump to storage/salvage vessels.

All Spills: Decontaminate the area of the spill thoroughly using detergent and water. Place all spill residue in an appropriate container and seal. Do not mix with wastes from other materials. If necessary, discard contaminated response equipment or rinse with soapy water before returning such equipment to service. Dispose of in accordance with applicable international, national, state, and local procedures (see Section 13, Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Do not flush to sewer.

REFERENCE TO OTHER SECTIONS: See Section 13, Disposal Considerations for more information.

7. HANDLING and USE

PRECAUTIONS FOR SAFE HANDLING: All employees who handle this material should be trained to handle it safely. Avoid unnecessary contact. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

CONDITIONS FOR SAFE STORAGE: Keep container tightly closed when not in use. Store corn oil in a closed vessel protected from light at or below 29°C (85°F). 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. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Containers should be separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Refer to NFPA 30, *Flammable and Combustible Liquids Code*, for additional information on storage. Have appropriate extinguishing equipment in the storage area (such as sprinkler systems or portable fire extinguishers. Empty containers may contain residual product; therefore, empty containers should be handled with care. WARNING! Dangerous spontaneous heating may occur during storage if leaks impregnate rags, waste, etc. Organic oils can slowly oxidize when spread in a film and oil on cloths, mops, absorbents may auto-oxidize and generate heat, smolder, ignite and burn. In the workplace oily rags should be collected and immersed in water.

SPECIFIC USE(S): This product is used in various industries. Follow all industry standards for use of this product.

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. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment thoroughly, before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures, or applicable standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

VENTILATION AND ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits provided in this section, if applicable. Use a non-sparking, grounded, explosion-proof ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside, taking necessary precautions for environmental protection.

OCCUPATIONAL EXPOSURE LIMITS:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	OTHER
		TWA ppm	STEL ppm	TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	ppm
Corn Oil Exposure limits given are for vegetable oil mists	8001-30-7	NE	NE	15 (total dust), 5 (respirable fraction)	NE	10 (total dust), 5 (respirable fraction)	NE	NE	NE

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

INTERNATIONAL EXPOSURE LIMITS: Currently, there are no international exposure limits in place the components of this product. Exposure limits change and should be checked for currency.

PERSONAL PROTECTIVE EQUIPMENT:

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-07), standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection. Please reference applicable regulations and standards for relevant details.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

PERSONAL PROTECTIVE EQUIPMENT (continued):

RESPIRATORY PROTECTION: Maintain the Oxygen level above 19.5% in the workplace. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) and equivalent U.S. State standards, Canadian CSA Standard Z94.4-93 and the European Standard EN 529:2005 and Respiratory Protection Standards of EU member states. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA's Respiratory Protection Standard (1910.134-1998).

HAND PROTECTION: Wear glove protection appropriate to the specific operation for which this product is used. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, or the European Standard CEN/TR 15419:2006.

EYE PROTECTION: Use approved safety goggles or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133, the Canadian CSA Standard Z94.3-M1982, *Industrial Eye and Face Protectors,* or the European Standard CR 13464:1999 for further information.

BODY/SKIN PROTECTION: When chemical contact is possible, use splash apron or work uniform to prevent unnecessary contact. If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada for further information. If necessary, refer to OSHA Technical Manual (Section VII: Personal Protective Equipment), or refer to appropriate Standards of Canada, or the European Standard CEN/TR 15419:2006, for further information. 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 and the Canadian CSA Standard Z195-M1984, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Liquid
COLOR: Light reddish-orange.
MOLECULAR WEIGHT: Variable.
MOLECULAR FORMULA: Variable
ODOR: Characteristic of corn.
ODOR THRESHOLD: Not available.
VAPOR DENSITY: 1.037
VAPOR PRESSURE: Not available.
SPECIFIC GRAVITY (air = 1): 0.98
MELTING/FREEZING POINT: -14°C (6.8°F)
EXPANSION RATIO: Not applicable.
SPECIFIC VOLUME: Not available.
SOLUBILITY IN WATER: Insoluble in cold water.
BOILING POINT: Not available.
SOLUBILITY IN SOLVENTS: Not available.
pH: 7-9
COEFFICIENT WATER/OIL DISTRIBUTION: Not available
VISCOSITY: Not available.

HOW TO DETECT THIS SUBSTANCE (identification properties): The appearance of this product may be a method to identify it in event of accidental release.

10. STABILITY and REACTIVITY

REACTIVITY/CHEMICAL STABILITY: Stable under conditions of normal temperature and pressure. Not reactive.
DECOMPOSITION PRODUCTS: *Combustion:* Carbon oxides. *Hydrolysis*: None.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is incompatible with oxidizers.
POSSIBILITY OF HAZARDOUS REACTION OR POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Avoid extreme temperatures and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The health hazard information provided below is pertinent to employees using this product in an occupational setting. The following paragraphs describe the symptoms of exposure by route of exposure.

INHALATION: Inhalation of airborne mists or sprays of this product may cause irritation of the respiratory system. Symptoms may include difficulty breathing and coughing. Adverse effects are expected to cease after removal to fresh air.

CONTACT WITH SKIN or EYES: Brief skin contact is should not be irritating. Prolonged or repeated skin contact with corn oil can cause sensitization and allergic reaction in susceptible individuals. Eye contact can cause irritation, with pain, tearing redness.

SKIN ABSORPTION: This product does not present a hazard of skin absorption.

INGESTION: Ingestion of this product in the workplace is unlikely. If small quantity is digested, no adverse effect is expected. If large quantity is ingested, digestive upset with vomiting and diarrhea may occur. Aspiration into the lungs following vomiting can lead to dangerous oil-induced pneumonia or pulmonary edema.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to this material may cause the following health effects:

ACUTE: Inhalation of aerosols of this product may be irritating to respiratory system. Eye contact may cause transient irritation. Ingestion of large quantity may cause gastric upset. Aspiration into lungs may cause oil-induced pneumonia or edema.

11. TOXICOLOGICAL INFORMATION (Continued)

HEALTH EFFECTS OR RISKS FROM EXPOSURE (continued):

CHRONIC: Chronic skin contact may result in sensitization and allergic reaction in susceptible individuals.

TARGET ORGANS: ACUTE: Respiratory system, eyes.
CHRONIC: Skin

TOXICITY DATA: There following toxicity data are available for Corn Oil.

CORN OIL:

Standard Draize Test (Skin-Human) 300 mg/3 days-intermittent: Mild

LD_{50} (Oral-Rat) > 100 mL/kg

LD_{50} (Intraperitoneal-Mouse) > 50 gm/kg

TDLo (Oral-Rat) 2,575,000 mg/kg/103 weeks-intermittent: Blood: leukemia; Endocrine: adrenal cortex tumors; Tumorigenic: active as anti-cancer agent

TDLo (Oral-Rat) 315 gm/kg/15 weeks-continuous: Blood: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

TDLo (Oral-Rat) 240 gm/kg/60 days-continuous: Skin and Appendages: breast Tumorigenic: facilitates action of known carcinogen

TDLo (Oral-Rat) 1200 gm/kg/60 days-continuous: Skin and Appendages: breast; Tumorigenic: facilitates action of known carcinogen; Biochemical: Metabolism (Intermediary): lipids including transport

TDLo (Oral-Rat) 18.36 mg/kg/4 days-intermittent: Behavioral: food intake (animal)

TDLo (Oral-Rat) 1344 gm/kg/32 weeks-continuous: Tumorigenic: protects against induction of experimental tumors

TDLo (Oral-Rat) 2600 mL/kg/2 years-intermittent: Tumorigenic: neoplastic by RTECS criteria; Gastrointestinal: tumors

TDLo (Oral-Rat) 1,287,500 mg/kg/103 weeks-intermittent: Tumorigenic: neoplastic by RTECS criteria; Gastrointestinal: tumors

TDLo (Oral-Rat) 12,500 mg/kg: female 15-19 day(s) after conception: Reproductive: Specific Developmental Abnormalities: blood and lymphatic systems (including spleen and marrow), immune and reticuloendothelial system

TDLo (Oral-Rat) 360 gm/kg: female 10-22 day(s) after conception lactating female 23 day(s) post-birth: Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (Oral-Rat) 50 mL/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), other effects to embryo

TDLo (Oral-Rat) 390 mL/kg: female 2 week(s) pre-mating: 3 day(s) post-birth: Reproductive: Maternal Effects: other effects; Effects on Newborn: viability index (e.g., # alive at day 4 per # born alive)

TDLo (Oral-Mouse) 91.8 mg/kg/10 days-intermittent: Liver: changes in liver weight

TDLo (Oral-Mouse) 64.26 mg/kg/7 days-intermittent: Behavioral: food intake (animal)

TDLo (Oral-Mouse) 30 gm/kg: female 15-17 day(s) after conception: Reproductive: Specific Developmental Abnormalities: immune and reticuloendothelial system

TDLo (Oral-Mouse) 100 mL/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), other effects to embryo

TDLo (Intramuscular-Rat) 1 mL/kg: Reproductive: Maternal Effects: oogenesis, uterus, cervix, vagina

TDLo (Intramuscular-Rat) 1 mL/kg: female 1 day(s) pre-mating: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants), litter size (e.g. # fetuses per litter; measured before birth)

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	1
FLAMMABILITY HAZARD	(RED)	1
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
SEE SECTION 8			

For Routine Industrial Use and Handling Applications

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

CARCINOGENIC POTENTIAL: Corn Oil is not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, and ACGIH, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Under normal circumstances this product does not cause irritation. Inhalation of aerosols may cause irritation of the respiratory system. Eye contact may cause irritation.

SENSITIZATION TO THE PRODUCT: Prolonged or chronic skin contact may cause sensitization and allergic reaction in susceptible individuals.

SYNERGISTIC MATERIALS: None known.

REPRODUCTIVE TOXICITY INFORMATION: Corn Oil is not reported to cause human mutagenic, embryotoxic, teratogenic or reproductive effects.

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryo toxin 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.

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, ACGIH Biological Exposure Indices (BEIs) have not been determined for Corn Oil.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY IN SOIL: This product has not been tested for mobility in soils; It is expected to be highly mobile.

PERSISTENCE AND BIODEGRADABILITY: As an organic oil this product is expected to fully biodegrade and does not present a hazard of persistence.

BIO-ACCUMULATION POTENTIAL: This product does not present a hazard of bioaccumulation.

ECOTOXICITY: No specific toxicity data is available for Corn Oil.

12. ECOLOGICAL INFORMATION (Continued)

OTHER ADVERSE EFFECTS: This product has no ozone depletion potential.
ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT/DISPOSAL METHODS: It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. 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. Shipment of wastes must be done with appropriately permitted and registered transporters.
DISPOSAL CONTAINERS: Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done per all applicable regulations.
PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials. Dispose of in accordance with applicable Federal, State, and local procedures and standards.
EPA WASTE NUMBER: Not applicable.
EUROPEAN WASTE CODES: Not applicable.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is not classified as Dangerous Goods, per regulations of Transport Canada.
INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA): product is not classified as dangerous goods, per the International Air Transport Association.
INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): product is not classified as dangerous goods, per the International Maritime Organization.
EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This product is not classified by the Economic Commission for Europe to be dangerous goods.
TRANSPORT IN BULK ACCORDING TO THE IBC CODE: Not applicable.
ENVIRONMENTAL HAZARDS: This product does not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN); Corn Oil is not specifically listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

ADDITIONAL UNITED STATES REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.
U.S. SARA SECTION 302 THRESHOLD PLANNING QUANTITY (TPQ): None.
U.S. SARA SECTION 304 REPORTABLE QUANTITY (TPQ): None
U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.
U.S. TSCA INVENTORY STATUS: Corn Oil is listed on the TSCA Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This product is not on the California Proposition 65 lists.
ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL STATUS: Corn Oil is listed on the DSL inventory.
CANADIAN ENVIRONMENTAL PROTECTION AGENCY (CEPA) PRIORITIES SUBSTANCES LIST: Not applicable.
CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product does not meet the criteria of a Controlled Product, per the Controlled Product Regulations.
ADDITIONAL EUROPEAN REGULATIONS:
SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE PRODUCT: Currently, there is no specific legislation pertaining to this product.
CHEMICAL SAFETY ASSESSMENT: No data available. The chemical safety assessment is required for some substances according to European Union Regulation (EC) 1907/2006, Article 14.

16. OTHER INFORMATION

ANSI LABELING (Z129.1): CAUTION! COMBUSTIBLE LIQUID. WADDED UP AND PRODUCT-SOAKED PAPER TOWELS OR RAGS THROWN INTO THE TRASH OR LEFT IN A PILE CAN START A FIRE. AEROSOLS MAY CAUSE RESPIRATORY TRACT IRRITATION. EYE CONTACT MAY CAUSE TRANSIENT IRRITATION. PROLONGED SKIN CONTACT MAY CAUSE SENSITIZATION AND ALLERGIC REACTION IN SUSCEPTIBLE INDIVIDUALS. Keep away from heat and flame. Avoid contact with skin, eyes, and clothing. Avoid breathing vapors, mists, or sprays. Do not taste or swallow. Avoid prolonged or repeated skin contact. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear appropriate eye, hand, and body protection. Avoid exposure to elevated temperatures. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, foam, dry chemical, or CO_2, avoid jets of water. **IN CASE OF SPILL:** Wipe up or absorb spilled liquid. Place residual in appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations.

GLOBAL HARMONIZATION and EU CLP REGULATION (EC) 1272/2008 LABELING and CLASSIFICATION: An official classification has been published under the Global Harmonization Standard and the CLP Regulation (EC) 1272/2008 for Corn Oil. This product does not meet the criteria for any hazard classification.

EU LABELING AND CLASSIFICATION 67/548/EEC: An official classification has been published under the European Community Council Directive 67/548/EEC or subsequent Directives for Corn Oil. This product does not meet the criteria for any hazard classification.

MIXTURES: When two or more compounds or mixtures are combined, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you use the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product.

REVISIONS DETAILS: New.

REFERENCES AND DATA SOURCES: Contact the supplier for information.

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: The official classification in EC regulations was used for classification.

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DEFINITION 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 constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DFG MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances that have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances that are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*; in exceptional cases, substances for which there are no *in vivo* data, but that are clearly mutagenic in vitro and structurally related to known in vivo mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

DFG MAK Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed.

EXPOSURE LIMITS IN AIR (continued):

DFG MAK Pregnancy Risk Group Classification (continued): Group B: Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. **Group C:** There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. **Group D:** Classification in one of the groups A–C is not yet possible because, although the data available may indicate a trend, they are not sufficient for final evaluation.

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.

LOQ: Limit of Quantitation.

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH's Recommended Exposure Limits.

PEL: OSHA's Permissible Exposure Limits. 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.

DEFINITION OF TERMS (Continued)

EXPOSURE LIMITS IN AIR (continued):

SKIN: Used when a there is a danger of cutaneous absorption.

STEL: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

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.

TWA: Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEEL: Workplace Environmental Exposure Limits from the AIHA.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards. HEALTH HAZARD: **0** Minimal Hazard: No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation*: Essentially non-irritating. Mechanical irritation may occur. PII or Draize = 0. *Eye Irritation*: Essentially non-irritating, minimal effects clearing in < 24 hours. Mechanical irritation may occur. Draize = 0. *Oral Toxicity LD_{50} Rat*: > 5000 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 2000 mg/kg. *Inhalation Toxicity 4-hrs LC_{50} Rat*: > 20 mg/L. **1** Slight Hazard: Minor reversible injury may occur; may irritate the stomach if swallowed; may defat the skin and exacerbate existing dermatitis. *Skin Irritation*: Slightly or mildly irritating. PII or Draize > 0 < 5. *Eye Irritation*: Slightly to mildly irritating, but reversible within 7 days. Draize > 0 ≤ 25. *Oral Toxicity LD_{50} Rat*: > 500–5000 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 1000–2000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 2–20 mg/L. **2** *Moderate Hazard*: Temporary or transitory injury may occur; prolonged exposure may affect the CNS. *Skin Irritation*: Moderately irritating; primary irritant; sensitizer. PII or Draize ≥ 5, with no destruction of dermal tissue. *Eye Irritation*: Moderately to severely irritating; reversible corneal opacity; corneal involvement or irritation clearing in 8–21 days. Draize = 26–100, with reversible effects. *Oral Toxicity LD_{50} Rat*: > 50–500 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 200–1000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.5–2 mg/L. **3** Serious Hazard: Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation*: Severely irritating and/or corrosive; may cause destruction of dermal tissue, skin burns, and dermal necrosis. PII or Draize > 5–8, with destruction of tissue. *Eye Irritation*: Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD_{50} Rat*: > 1–50 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 20–200 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.05–0.5 mg/L. **4** Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposures; extremely toxic; irreversible injury may result from brief contact. *Skin Irritation*: Not appropriate. Do not rate as a 4, based on skin irritation alone. *Eye Irritation*: Not appropriate. Do not rate as a 4, based on eye irritation alone. *Oral Toxicity LD_{50} Rat*: ≤ 1 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: ≤ 20 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: ≤ 0.05 mg/L.

FLAMMABILITY HAZARD: **0** Minimal Hazard: Materials that will not burn in air when exposure to a temperature of 815.5°C (1500°F) for a period of 5 minutes. **1** Slight Hazard: Materials that must be pre-heated before ignition can occur. Material requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. This usually includes the following: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C (200°F) (i.e. OSHA Class IIIB); and Most ordinary combustible materials (e.g. wood, paper, etc.). **2** Moderate Hazard: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres with air. This usually includes the following: Liquids having a flash-point at or above 37.8°C (100°F); Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp); and Solids and semisolids (e.g. viscous and slow flowing as asphalt) that readily give off flammable vapors. **3** Serious Hazard: Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions. This usually includes the following: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 38°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. OSHA Class IB and IC); Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air (e.g., dusts of combustible solids, mists or droplets of flammable liquids); and Materials that burn extremely rapidly, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). **4** Severe Hazard: Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and that will burn readily. This usually includes the following: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. OSHA Class IA); and Materials that ignite spontaneously when exposed to air at a temperature of 54.4°C (130°F) or below (pyrophoric).

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD: **0** *Water Reactivity*: Materials that do not react with water. *Organic Peroxides*: Materials that are normally stable, even under fire conditions and will not react with water. *Explosives*: Substances that are Non-Explosive. *Compressed Gases*: No Rating. *Pyrophorics*: No Rating. *Oxidizers*: No 0 rating. *Unstable Reactives*: Substances that will not polymerize, decompose, condense, or self-react.). **1** *Water Reactivity*: Materials that change or decompose upon exposure to moisture. *Organic Peroxides*: Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy violently. *Explosives*: Division 1.5 & 1.6 explosives. Substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases*: Pressure below OSHA definition. *Pyrophorics*: No Rating. *Oxidizers*: Packaging Group III oxidizers; Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives*: Substances that may decompose condense, or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. Substances that readily undergo hazardous polymerization in the absence of inhibitors. **2** *Water Reactivity*: Materials that may react violently with water. *Organic Peroxides*: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. *Explosives*: Division 1.4 explosives. Explosive substances where the explosive effects are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases*: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group II oxidizers. Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%)/cellulose mixture and the criteria for Packing Group I are not met. *Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential (or low risk) for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature. **3** *Water Reactivity*: Materials that may form explosive reactions with water. *Organic Peroxides*: Materials that are capable of detonation or explosive reaction, but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water. *Explosives*: Division 1.3 explosives. Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases*: Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group I oxidizers. Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a moderate potential (or moderate risk) to cause significant heat generation or explosion. **4** *Water Reactivity*: Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides*: Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives*: Division 1.1 & 1.2 explosives. Explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases*: No Rating. *Pyrophorics*: Add to the definition of Flammability 4. *Oxidizers*: No 4 rating. *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a high potential (or high risk) to cause significant heat generation or explosion.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: **0** Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials. Gases and vapors with an LC_{50} for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC_{50} for acute inhalation toxicity greater than 200 mg/L. Materials with an LD_{50} for acute dermal toxicity greater than 2000 mg/kg. Materials with an LD_{50} for acute oral toxicity greater than 2000 mg/kg. Materials essentially non-irritating to the respiratory tract, eyes, and skin. **1** Materials that, under emergency conditions, can cause significant irritation. Gases and vapors with an LC_{50} for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an LC_{50} for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L. Materials with an LD_{50} for acute dermal toxicity greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials that slightly to moderately irritate the respiratory tract, eyes and skin. Materials with an LD_{50} for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC_{50} for acute inhalation toxicity greater than 3,000 ppm but less than or equal to 5,000 ppm.

DEFINITION OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **2 (continued):** Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Dusts and mists with an LC_{50} for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LD_{50} for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. Materials whose LD_{50} for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. **3** Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC_{50} for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LC_{50} for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD_{50} for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD_{50} for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an LC_{50} for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 1000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD_{50} for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD_{50} for acute oral toxicity is less than or equal to 5 mg/kg.

FLAMMABILITY HAZARD: **0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in according with Annex D of NFPA 704. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in according with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the *Method of Testing for Sustained Combustibility*, per 49 CFR 173, Appendix H or the UN *Recommendations on the Transport of Dangerous Goods, Model Regulations* (current edition) and the related *Manual of Tests and Criteria* (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85% by weight. Liquids that have no fire point when tested by ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

FLAMMABILITY HAZARD: **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures with air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal, and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily. Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air, Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500°C (932°F) when tested by differential scanning calorimetry. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater.

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 vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. Autoignition Temperature: Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. LEL: Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. UEL: Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. LD_{50}: Lethal Dose (solids & liquids) that kills 50% of the exposed animals. LC_{50}: Lethal Concentration (gases) that kills 50% of the exposed animals. ppm: Concentration expressed in parts of material per million parts of air or water. mg/m^3: 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. TDLo: Lowest dose to cause a symptom. TCLo: Lowest concentration to cause a symptom. TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo: Lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** IARC: International Agency for Research on Cancer. NTP: National Toxicology Program. RTECS: Registry of Toxic Effects of Chemical Substances. 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 Information:** BEI: ACGIH 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: Effect concentration in water. BCF: Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. TLm: Median threshold limit. log K_{OW} or log K_{OC}: Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S.:

EPA: U.S. Environmental Protection Agency. ACGIH: American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits. OSHA: U.S. Occupational Safety and Health Administration. NIOSH: National Institute of Occupational Safety and Health, which is the research arm of OSHA. DOT: U.S. Department of Transportation. TC: Transport Canada. SARA: Superfund Amendments and Reauthorization Act. TSCA: U.S. Toxic Substance Control Act. CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollutant status according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

CANADA:

WHMIS: Canadian Workplace Hazardous Materials Information System. TC: Transport Canada. DSL/NDSL: Canadian Domestic/Non-Domestic Substances List.