

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER

TRADE NAME (AS LABELED): PRESERVA® WOOD STAIN 250 VOC
CHEMICAL NAME/CLASS: Mineral Spirits Solvent and Oil Stain
SYNONYMS: None
PRODUCT USE: Wood Stain

SUPPLIER OF THE SAFETY DATA SHEET

U.S. SUPPLIER/MANUFACTURER'S NAME: Preserva Products Ltd.
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DATE OF PREPARATION: April 13, 2011
DATE OF REVISION: November 26, 2018

NOTE: ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS 2015 and the Global Harmonization required information is included in appropriate sections based on the Global Harmonization Standard format. This product has been classified in accordance with the hazard criteria of the countries listed above and the SDS contains all the information required by the Canadian WHMIS 2015 [HPR-GHS], the Global Harmonization Standard and OSHA 1910.120.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: Classified in accordance with Global Harmonization Standard under U.S. OSHA Hazard Communication Standard, and the Canadian WHMIS HPR-GHS 2015.

Classification: Flammable Liquid Cat. 4, Aspiration Hazard Cat. 2, Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4, Acute Inhalation Toxicity Cat. 4, Skin Irritation Cat. 2, Eye Irritation Cat. 2A, Skin Sensitization Cat. 1B, Respiratory Sensitization Cat. 1B, STOT (Inhalation-Respiratory Irritation/Narcotic Effect) SE Cat. 3, Aquatic Acute Toxicity Cat. 3

Signal Word: Danger Hazard Statement Codes: H227, H304, H302 + H312 + H332, H315, H319, H317, H334, H335, H336, H413

Precautionary Statement Codes: P210, P261, P264, P271, P280, P284, P370 + P378, P301 + P310, P331, P302 + P352, P333 + P313, P362 + P364, P305 + P351 + P338, P337 + P313, P304 + P340, P342 + P311, P321, P403 + P233, P405, P501

Hazard Symbols/Pictograms: GHS07, GHS08



See Section 16 for full text of classification

Product Description: This product is an amber or brown (if pigmented) liquid with a mild solvent odor. **Health Hazards:** Inhalation exposure to the vapors of this product can cause central-nervous system effects (dizziness, drowsiness, nausea, and headaches). Eye contact can cause moderate to severe irritation. Skin contact may be irritating, especially if contact is prolonged. Ingestion may cause central nervous system effects. Ingestion of large quantities may be fatal. Ingestion may lead to aspiration into the lungs. Evidence exists that the Soy Oil component may cause skin sensitization and allergic reaction in susceptible persons. In addition, persons previously exposed by inhalation to soy bean dusts may also suffer respiratory sensitization and allergic reaction to aerosols of Soy Oil and this product. **Flammability Hazards:** This product is combustible and may form potentially explosive mixtures with air if subjected to high ambient temperatures or if highly heated. **WARNING!** Rags, paper or other combustible materials soaked in this product can cause an extreme fire hazard when not disposed of properly. See Section 7 (Handling and Storage) for more information. Vapors of this product may travel to a source of ignition and flashback to a leak or open container. If involved in a fire, this product will release smoke, acrid vapors and toxic gases (i.e., carbon oxides, aromatic hydrocarbons, reactive hydrocarbons and aldehydes). **Reactivity Hazards:** This product is not reactive. **Environmental Hazards:** Release of this product to the environment may cause harm to plants and animals. Although not tested for toxicity to aquatic organisms, all release to aquatic or terrestrial environments should be avoided. Release to waterways may cause fouling, and creation of hypoxic environments. **Emergency Response Considerations:** Emergency responders must wear proper personal protective equipment (and have appropriate fire protection) suitable for the situation to which they are responding.

3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	LABEL ELEMENTS GHS Classification under U.S. OSHA Hazard Communication Standard and Canadian WHMIS 2015 Hazard Statement Codes
Linseed Oil	8001-26-1	35.54%	NOTIFIED EU ECHA CLASSIFICATION: Classification: Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4, Acute Inhalation Toxicity Cat. 4, Skin Irritation Cat. 2, Eye Irritation Cat. 2A, Skin Sensitization Cat. 1B, Respiratory Sensitization Cat. 1B Hazard Statement Codes: H302 + H312 + H332, H315, H319, H317, H334
Proprietary Alkyd Resin		5.0%	Classification: Not Determined
Mineral Spirits	64742-88-7	28.0%	HARMONIZED EU ECHA CLASSIFICATION: Classification: Aspiration Hazard Cat. 1, STOT (Central Nervous System) RE Cat. 1 Hazard Statement Codes: H304, H372 ADDITIONAL NOTIFIED EU ECHA CLASSIFICATION: Classification: Flammable Liquid Cat. 3, Skin Irritation Cat. 2, STOT (Inhalation-Narcotic Effect) SE Cat. 3, Aquatic Chronic Toxicity Cat. 2 Hazard Statement Codes: H226, H315, H336, H412

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

3. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	% w/w	LABEL ELEMENTS GHS Classification under U.S. OSHA Hazard Communication Standard and Canadian WHMIS 2015 Hazard Statement Codes
Soy Oil	8001-22-7	28.46%	SELF CLASSIFICATION: Classification: Germ Cell Mutagen Cat. 2, Skin Sensitization Cat. 1B Hazard Statement Codes: H341, H317
Proprietary Vegetable Oil		2.0%	Classification: Not Applicable.
Proprietary Brown Pigment Mixture		1.0%	Classification: Not Applicable.
Other Trace Ingredients (less than 1% or 0.1% for carcinogens, mutagens & reproductive toxins)		Balance	Classification: Not Applicable

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

4. FIRST-AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: Rescuers should be taken for medical attention if necessary. Remove or cover gross contamination to avoid exposure to rescuers.

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must seek medical attention if any adverse effect occurs. Take a copy of label and SDS to physician or health professional with the contaminated individual.

Skin Exposure: If this product contaminates the skin and irritation develops, immediately begin decontamination with soap and water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. The contaminated individual must seek medical attention if adverse effects continue after flushing.

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

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.

IMPORTANT SYMPTOMS AND EFFECTS: See Sections 2 (Hazard Identification) and 11 (Toxicological Information).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions, skin disorder, or disorders involving the "Target Organs" (see Section 11, "Toxicological Information") may be aggravated by exposure to this product.

IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Treat symptoms and eliminate exposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations may prove useful.

5. FIRE-FIGHTING MEASURES

FLASH POINT (Pensky-Martens Closed Cup): 62.8°C (145°F)

AUTOIGNITION TEMPERATURE: For Mineral Spirits: 245°C (473°F)

FLAMMABLE LIMITS (in air by volume, %): The following values are for the Mineral Spirits component: Lower (LEL): 0.6% Upper (UEL): 6.5%

FIRE EXTINGUISHING MEDIA: Fire extinguishing materials that can be used against fires of this product include carbon dioxide, dry chemical powder, or appropriate foam. Consideration for surrounding materials must be taken into account.

UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

SPECIAL FIRE AND EXPLOSION HAZARDS: This product is a Class II combustible liquid; it must be heated to a relatively high temperature before ignition can occur. When involved in a fire, this material may ignite and produce irritating vapors and toxic gases (e.g. carbon oxides, aromatic hydrocarbons, reactive hydrocarbons and aldehydes). This product can float on water and may travel to distant locations and/or spread fire. **WARNING!** By itself, this product will not spontaneously combust, but rags and waste soaked in the product can catch fire when the product dries. The drying reaction is exothermic, and the heat given off in that process

can cause the rags, as well as combustible materials such as paper or wood to ignite. See Section 7 (Handling and Storage) for more information.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

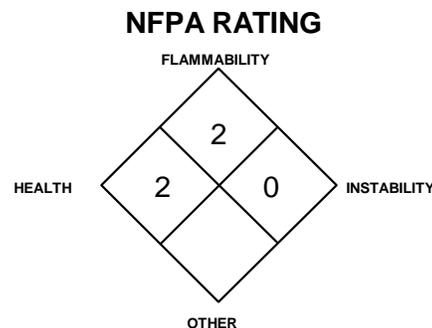
Explosion Sensitivity to Static Discharge: The vapors of this product may be ignited by static electrical energy.

ADVICE TO FIRE-FIGHTERS: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. 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 AND EMERGENCY PROCEDURES: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666). The atmosphere must at least 19.5 percent Oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection.

PROTECTIVE EQUIPMENT:



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

Small Spills: Wear rubber gloves, splash goggles, and appropriate body protection.

6. ACCIDENTAL RELEASE MEASURES (Continued)

PROTECTIVE EQUIPMENT (continued):

Large Spills: Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus.**

METHODS FOR CLEANUP AND CONTAINMENT: Eliminate all sources of ignition before cleanup begins. Use non-sparking tools.

Small Spills: Wipe up spilled liquid with polypads or other suitable absorbent materials.

Large Spills: Absorb spilled liquid with clay or other suitable absorbent materials.

All Spills: Decontaminate the area of the spill thoroughly using detergent and water. **WARNING!** Rags, paper or other combustible materials soaked in this product can cause an extreme fire hazard when not disposed of properly. See Section 7 (Handling and Storage) for more information. All contaminated materials and other spilled material must be placed in sealed containers and disposed of properly. 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). Dispose of recovered material and report spill per regulatory requirements.

ENVIRONMENTAL PRECAUTIONS: Avoid release to the environment. Run-off water may be contaminated by other materials and should be contained to prevent possible environmental damage.

REFERENCE TO OTHER SECTIONS: See information in Section 8 (Exposure Controls – Personal Protection) and Section 13 (Disposal Considerations) for additional information.

7. HANDLING and STORAGE

PRECAUTIONS FOR SAFE HANDLING: **WARNING!** Wadded up and oil-soaked paper towels, rags or other combustible materials thrown into the trash pose an extreme fire hazard when placed in trash, or left in a pile and can start a fire. The same is true if the absorbent used to clean up a spill is paper, wood or other combustible material; **Do NOT** throw in trash. All materials contaminated by this product should be placed in sealed containers and treated as highly flammable. Avoid spontaneous combustion by soaking rags, brushes rollers, etc. contaminated with product, in water then place into a sealed metal container before proper disposal. All employees who handle this material should be trained to handle it safely. As with all chemicals, avoid getting this product **ON YOU** or **IN YOU**. Use in a well-ventilated location. Keep away from heat, sparks, and other sources of ignition. Use non-sparking tools. Open containers slowly on a stable surface. Bond and ground containers during transfers of material. Do not expose containers to extreme temperatures. Avoid breathing airborne mists, sprays, or vapors generated by this product. Wash thoroughly after using this product. Do not eat or drink while using this product. Remove contaminated clothing immediately.

CONDITIONS FOR SAFE STORAGE: Product should be stored in a sealed metal container. Store in a dry location at the recommended temperature of 10-32.2°C (50-90°F). Keep container tightly closed when not in use. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers, as appropriate. 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. Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers). Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Refer to NFPA 30, *Flammable and Combustible Liquids Code*, for additional information on storage. Empty containers may contain residual liquid or vapors that are flammable; therefore, empty containers should be handled with care. Never perform any welding, cutting, soldering, drilling, or other hot work on an empty container or piping until all liquid, vapors, and residue have been cleared.

SPECIFIC END USE(S): This product is used as a wood stain. 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). If necessary, ensure that application equipment is locked and tagged-out safely. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

Ventilation and Engineering Controls: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this section, if applicable. Exhaust directly to the outside, taking necessary precautions for environmental protection. Ensure eyewash/safety shower stations and appropriate fire protection is available near areas where this product is used.

Occupational/Workplace Exposure Limits/Guidelines:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELS		NIOSH IDLH mg/m ³	OTHER mg/m ³
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³		
Linseed Oil	8001-26-1	NE	NE	NE	NE	NE	NE	NE	NE
Mineral Spirits Exposure limits are for Stoddard Solvent (CAS# 8052-41-3)	64742-88-7	525	NE	2500 525 (vacated 1989 PEL)	NE	300	1800 (ceiling 15 min.)	20,000	NE
Proprietary Alkyd Resin		NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Vegetable Oil Exposure limits are for Vegetable Oil Mists		NE	NE	15 (total dust); 5 (respir. fract.)	NE	10 (total dust); 5 (respir. fract.)	NE	NE	NE
Soy Oil Exposure limits are for soya bean constituents	8001-22-7	NE	NE	NE	NE	NE	NE	NE	DFG MAKs: Danger of Sensitization of the Airways

NE = Not Established.

See Section 16 for Definitions of Terms Used.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

ACGIH Biological Exposure Indices (continued): Currently, there are no ACGIH Biological Exposure Indices (BEIs) determined for the components of this product.

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), U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), 29 CFR 1910.133 for eye protection, 29 CFR 1910.138 for hand protection, 29 CFR 1910.136 for foot protection, or equivalent standards of Canada (including CSA Standard Z94.4-02, CSA Standard Z94.3-02, CSA Standard Z94.4-93 for respiratory protection, CSA Standard Z94.3-M1982, *Industrial Eye and Face Protectors* and CSA Standard Z195-M1984, *Protective Footwear*). Please reference applicable regulations and standards for relevant details.

Respiratory Protection: Maintain airborne contaminant concentrations below exposure limits listed in this section, if applicable. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93. Oxygen levels below 19.5% are considered IDLH by OSHA. 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 OSHA's Respiratory Protection Standard (1910.134-1998). The following are NIOSH respiratory protection guidelines for Stoddard Solvent (a related chemical to the Mineral Spirits component).

STODDARD SOLVENT

CONCENTRATION

RESPIRATORY PROTECTION

Up to 3500 mg/m³:

Any Chemical Cartridge Respirator with organic vapor cartridge(s), or any Supplied-Air Respirator (SAR).

Up to 8750 mg/m³³:

Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with organic vapor cartridge(s).

Up to 17,500 mg/m³:

Any Chemical Cartridge Respirator with a full facepiece and organic vapor cartridge(s), or any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any Powered, Air-Purifying Respirator (PAPR) with a tight-fitting facepiece and organic vapor cartridge(s), or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.

Up to 20,000 mg/m³:

Any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape:

Any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any appropriate escape-type, SCBA.

Eye Protection: Splash goggles or safety glasses. If necessary, refer to applicable regulations and standards for further information.

Hand Protection: Wear butyl rubber, Teflon™, Barricade™, Chemrel™, nitrile or similar gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to applicable regulations and standards.

Body Protection: When chemical contact is possible, use splash apron, work uniform, and shoes or coverlets to prevent skin contact. Full-body chemical protective clothing is recommended for emergency response procedures. If necessary, refer to applicable regulations and standards. 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 appropriate regulations and standard.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Liquid.

COLOR: Amber; brown, if pigmented.

ODOR: Mild solvent-like.

ODOR THRESHOLD: Not available.

VAPOR PRESSURE: Not tested.

EVAPORATION RATE (n-BuAc = 1): Not tested.

VISCOSITY DYNAMIC: Not tested.

BOILING POINT: Not tested.

VAPOR DENSITY: Heavier than air.

MELTING/FREEZING POINT: Not tested.

FLASH POINT (Pensky-Martens Closed Cup): 62.8°C (145°F)

AUTOIGNITION TEMPERATURE: Not determined for product. For Mineral Spirits: 245°C (473°F)

SATURATION VAPOR CONCENTRATION: Not tested.

pH: Not determined.

SPECIFIC GRAVITY @ 15.5°C (water = 1): 90 (wt/gal= 7.53)

VOC (Volatile Organic Carbon) Content in %: Less than 250 g/L

SOLUBILITY IN WATER: Practically insoluble.

SOLUBILITY IN OTHER LIQUIDS: Not tested.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): For Mineral Oil: Log P(oct) = 3.7-6.7

HOW TO DETECT THIS SUBSTANCE (identification properties): The odor of this product may be a identification property in event of an accidental release.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable under conditions of standard temperature and pressure.

DECOMPOSITION PRODUCTS: Combustion: Carbon oxides, aromatic hydrocarbons, reactive hydrocarbons and aldehydes.

Hydrolysis: None known.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product would be incompatible with strong oxidizing agents.

POSSIBILITY OF HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure or contact to ignition sources, extreme temperatures, incompatible chemicals. See Section 7 (Handling and Storage) for additional cautionary information related to materials contaminated with this product.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational exposure are inhalation and contact with skin and eyes. The symptoms of exposure to this product, via route of entry, are as follows:

Inhalation: Inhalation of vapors, mists or sprays from this product can cause mild central nervous system (CNS) depression with symptoms such as nausea, headache, vomiting, dizziness, incoordination and an appearance of drunkenness.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE (continued):

Inhalation (continued): The Soy Oil component is a potential respiratory sensitizer which may cause allergic reaction in susceptible individuals. Symptoms of allergic reaction may include, difficulty breathing, coughing, sneezing and wheezing.

Contact with Skin or Eyes: Vapors of this product can irritate the eyes. This product will cause immediate pain and severe irritation if splashed into the eyes, causing redness and tearing. Prolonged eye contact may cause corneal clouding or damage. Brief skin contact may be moderately irritating. Prolonged or repeated skin overexposures can cause dermatitis (dry red skin). The Soy Oil component has been shown to potentially cause skin sensitization and allergic reaction. Symptoms may include swelling, raised welts or weels, redness and itching.

Skin Absorption: The solvent component of this product can be absorbed through intact skin, but is not expected to cause significant adverse effects by this route of exposure.

Ingestion: Ingestion is not anticipated to be a significant route of overexposure for this product. If this product is swallowed, it may irritate the mouth, throat, esophagus and other tissues of the digestive system. Symptoms of ingestion may include vomiting, diarrhea, and nausea. Ingestion may also cause symptoms of depression of the central nervous system, as described under "Inhalation". If this product is aspirated into the lungs after ingestion, chemical pneumonia and edema (accumulation of fluid in the lungs) may result. Ingestion of large quantities of this product may be fatal.

Injection: Injection is not anticipated to be a significant route of overexposure for this product. Injection of this product (via puncture with a contaminated object) can cause pain and irritation, in addition to the wound.

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

Acute: Exposure to this product can moderately irritate contaminated eyes. May cause skin irritation. May be harmful by if swallowed, in contact with skin or if inhaled. Inhalation and ingestion exposure can cause depression of the central nervous system. Ingestion may be harmful or fatal and may cause aspiration into the lungs.

Chronic: Prolonged or repeated skin exposures can cause dermatitis (dry, red skin). Chronic inhalation or ingestion exposure may result in adverse effects on the liver. Persons susceptible to Soy Oil may experience skin and or respiratory sensitization and allergic reactions.

TARGET ORGANS: **Acute:** Respiratory system, skin, eyes, and central nervous system. **Chronic:** Skin, respiratory system, liver.

TOXICITY DATA: The specific toxicology data available for components present in 1% or greater concentration are as follows:

LINSEED OIL:

Standard Draize Test (Skin-Human) 300 mg/3 days-intermittent: Moderate
 IC₅₀ (In vitro-Rabbit Intestinal) 0.2 gm/L: Gastrointestinal: contraction (isolated tissue)
 ICLo (In vitro-Rabbit Intestinal) 3 gm/L: Gastrointestinal: relaxation (isolated tissue)
 TDLo (Oral-Rat) 135 gm/kg/45 days-intermittent: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases
 TDLo (Oral-Rat) 267.75 gm/kg: lactating female 0-21 day(s) post-birth: Reproductive: Maternal Effects: other effects; Effects on Newborn: biochemical and metabolic
 TDLo (Oral-Mouse) 756 gm/kg/63 days-intermittent: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Liver: other changes
 Heritable Translocation Test (Multiple Routes-Insect-*Drosophila melanogaster*) 6 pph/48 hours

MINERAL SPIRITS:

TCLo (Inhalation-Rat) 275 mg/m³/6 hours/16 days-intermittent: Liver: changes in liver weight
 TCLo (Inhalation-Rat) 2200 mg/m³/6 hours/16 days-intermittent: Liver: other changes
 TCLo (Inhalation-Rat) 275 mg/m³/6 hours/16 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain
 TCLo (Inhalation-Rat) 138 mg/m³/6 hours/16 days-intermittent: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight; Related to Chronic Data: changes in testicular weight
 TCLo (Inhalation-Rat) 550 mg/m³/6 hours/16 days-intermittent: Kidney/Ureter/Bladder: other changes in urine composition, changes in kidney weight; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)
 TCLo (Inhalation-Rat) 2200 mg/m³/6 hours/16 days-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified
 TCLo (Inhalation-Rat) 2200 mg/m³/6 hours/16 days-intermittent: Related to Chronic Data: death
 TCLo (Inhalation-Rat) 550 mg/m³/6 hours/16 days-intermittent: Kidney/Ureter/Bladder: other changes
 TCLo (Inhalation-Rat) 1100 mg/m³/6 hours/16 days-intermittent: Kidney/Ureter/Bladder: other changes, Kidney tumors
 TCLo (Inhalation-Rat) 550 mg/m³/6 hours/16 days-intermittent: Endocrine: thyroid tumors
 TCLo (Inhalation-Rat) 138 mg/m³/91 days-intermittent: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight; Related to Chronic Data: changes in testicular weight

MINERAL SPIRITS (continued):

TCLo (Inhalation-Rat) 1100 mg/m³/91 days-intermittent: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight
 TCLo (Inhalation-Rat) 550 mg/m³/91 days-intermittent: Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis), other changes
 TCLo (Inhalation-Rat) 550 mg/m³/2 years-intermittent: Endocrine: other changes, tumors
 TCLo (Inhalation-Rat) 2200 mg/m³/91 days-intermittent: Kidney/Ureter/Bladder: other changes
 TCLo (Inhalation-Mouse) 275 mg/m³/6 hours/16 days-intermittent: Liver: changes in liver weight
 TCLo (Inhalation-Mouse) 2200 mg/m³/6 hours/16 days-intermittent: Liver: other changes
 TCLo (Inhalation-Mouse) 2200 mg/m³/6 hours/16 days-intermittent: Liver: changes in liver weight; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)
 TCLo (Inhalation-Mouse) 138 mg/m³/6 hours/16 days-intermittent: Blood: changes in spleen
 TCLo (Inhalation-Mouse) 550 mg/m³/6 hours/16 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain
 TCLo (Inhalation-Mouse) 2200 mg/m³/6 hours/16 days-intermittent: Liver: tumors
 TCLo (Inhalation-Mouse) 1100 mg/m³/91 days-intermittent: Liver: changes in liver weight
 TCLo (Inhalation-Mouse) 2200 mg/m³/91 days-intermittent: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)
 TCLo (Inhalation-Mouse) 2200 mg/m³/2 years-intermittent: Liver: other changes, tumors
 TCLo (Inhalation-Mouse) 1100 mg/m³/2 years-intermittent: Liver: other changes

SOYBEAN OIL:

LD₅₀ (Intravenous-Rat) 16,500 mg/kg
 LD₅₀ (Intravenous-Mouse) 22,100 mg/kg
 TDLo (Oral-Rat) 299.25 gm/kg: Lactating female 0-21 day(s) post-birth: Reproductive: Maternal Effects: other effects
 TDLo (Intramuscular-Rat) 1 mL/kg: Endocrine: effect on menstrual cycle; Reproductive: Maternal Effects: oogenesis; uterus, cervix, vagina
 TDLo (Intramuscular-Rat) 1 mL/kg: female 1 day(s) pre-mating: Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)
 Specific Locus Test (Oral-*Drosophila melanogaster*) 12 pph/48 hours-continuous
 Heritable Translocation Test (Multiple Routes-Insect-*Drosophila melanogaster*) 12 pph/48 hours

CARCINOGENIC POTENTIAL: The components of this product are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, or ACGIH and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product can be irritating to contaminated respiratory system, skin and eyes.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2*
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FLAMMABILITY HAZARD	(RED)	2
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PHYSICAL HAZARD	(YELLOW)	0
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PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

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

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

SENSITIZATION TO THE PRODUCT: A double-blind, placebo-controlled, cross-over challenge study of the allergenicity of hydrogenated, partially hydrogenated, and cold-pressed soya bean oils was conducted in a group of seven individuals who had experienced allergic reactions after exposures that had occurred up to 10 years previously. All had positive reactions to a skin-prick test with soya bean extract. Other data exists that respiratory sensitization and allergic reaction to Soy Bean Oil can occur, especially if a person has been exposed to dusts from soy products previously.

REPRODUCTIVE TOXICITY INFORMATION: No specific information on human mutagenic, embryotoxic, teratogenic or reproductive toxicity effects is available for this product. The following data is available for some components.

Mutagenicity: Soybean Oil was tested for genotoxicity in the Drosophila wing somatic mutation and recombination assay. Results indicate that the oil produces genotoxic effects when tested without any previous frying or boiling processes. No data are available related to possible mutagenic effects on human cells.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: This product has not been tested for mobility in soil, but is expected to be highly mobile.

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. Some biodegradation is expected due to the organic oil components.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential.

ECOTOXICITY: This product has not been tested for aquatic toxicity; all release to the environment should be avoided.

OTHER ADVERSE EFFECTS: This product does not contain any component with known 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 to 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.

U.S. EPA WASTE NUMBER: Wastes of this product should be tested for waste characteristic ignitability (D001).

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: This product can be classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101. NOTE: The classification of Combustible liquid, n.o.s. applies only to shipments of this product via ground within the United States. There is no classification for 'Combustible Liquid' under Canadian TDG, IATA or the IMO.

Proper Shipping Name:	Combustible liquid, n.o.s. (mineral spirits, vegetable oils)
Hazard Class Number and Description:	Combustible Liquid
UN Identification Number:	NA 1993
Packing Group:	III
DOT Label(s) Required:	No label is required for a material classed as a combustible liquid
Special Provisions:	IB3, T1, T4, TP1
Packaging:	Exceptions: 150; Non-Bulk: 203; Bulk: 241
Quantity Limitations Passenger Aircraft:	60 L
Quantity Limitations Cargo Aircraft:	220 L
Vessel Storage:	Location: A; Other: None.
North American Emergency Response Guidebook Number, 2016:	128
Marine Pollutant:	No component is classified as a Marine Pollutant, per Appendix B to 49 CFR 172.101

This product can be reclassified as an ORM-D material and marked as follows until December 31st, 2010:

Proper Shipping Name:	Consumer Commodity
Hazard Class Number and Description:	ORM-D
UN Identification Number:	None
Packing Group:	None
DOT Label(s) Required:	No label is required for ORM-D materials.
Special Provisions:	None
Packaging:	Exceptions: 150; Non-Bulk: 306; Bulk: None
Quantity Limitations Passenger Aircraft:	30 kg gross
Quantity Limitations Cargo Aircraft:	30 kg gross
Vessel Storage:	Location: A; Other: None.

14. TRANSPORTATION INFORMATION (Continued)

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS (continued):

ORM-D Information:

- (a) Each non-bulk packaging containing a material classed as ORM-D must be marked on at least one side or end with the ORM-D designation immediately following or below the proper shipping name of the material. The ORM designation must be placed within a rectangle that is approximately 6.3 mm (0.25 inches) larger on each side than the designation. The designation for ORM-D must be:
- (1) ORM-D-AIR for an ORM-D that is prepared for air shipment and packaged in accordance with the provisions of 49 CFR § 173.27.
 - (2) ORM-D for an ORM-D other than as described in paragraph (a)(1) of this section.
- (b) When the ORM-D marking including the proper shipping name can not be affixed on the package surface, it may be on an attached tag.
- (c) The marking ORM-D is the certification by the person offering the packaging for transportation that the material is properly described, classed, packaged, marked and labeled (when appropriate) and in proper condition for transportation according to the applicable regulations of this subchapter. This form of certification does not preclude the requirement for a certificate on a shipping paper when required by subpart C of this part.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is NOT classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION/ICAO (IATA/ICAO): This product is NOT classified as dangerous goods, per rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO): This product is NOT classified as Dangerous Goods, per rules of IMO.

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); components of this product are not specifically listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

U.S. REGULATIONS:

U.S. SARA Reporting Requirements: No components of this product are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA 302 Extremely Hazardous Threshold Planning Quantity (TPQ): There are no specific Threshold Planning Quantities for the components of this product. The default Federal SDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. SARA 304 Extremely Hazardous Reportable Quantity (RQ): Not applicable.

U.S. CERCLA Reportable Quantity (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: The components of this product listed by CAS# in Section 3 (Composition and Information on Ingredients) are listed on the TSCA Inventory.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): No component of this of product is on the California Proposition 65 lists.

CANADIAN REGULATIONS:

Canadian DSL/NDSL Inventory Status: The components of this product are listed on the DSL or NDSL Inventories.

Other Canadian Regulations: Not applicable.

Canadian Environmental Protection Act (CEPA) Priority Substances Lists: The components of this product are not on the CEPA Priority Substances Lists.

Canadian WHMIS (HPR-GHS) 2015 Classification and Symbols: See Section 16 for in Classification and Symbols under HPR-GHS 2015.

16. OTHER INFORMATION

GLOBAL HARMONIZATION SYSTEM CLASSIFICATION:

Classification: Flammable Liquid Category 4, Aspiration Hazard Category 2, Acute Oral Toxicity Category 4, Acute Dermal Toxicity Category 4, Acute Inhalation Toxicity Category 4, Skin Irritation Category 2, Eye Irritation Category 2A, Skin Sensitization Category 1B, Respiratory Sensitization Category 1B, Specific Target Organ Toxicity (Inhalation-Respiratory Irritation/Narcotic Effect) Single Exposure Category 3, Aquatic Acute Toxicity Category 3

Hazard Statements: H227: Combustible liquid. H304: May be fatal if swallowed and enters airways. H302 + H312 + H332: Harmful if swallowed, in contact with skin or if inhaled. H315: Causes skin irritation. H319: Causes serious eye irritation. H317: May cause an allergic skin reaction. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335: May cause respiratory irritation. H336: May cause drowsiness or dizziness. H413: May cause long-lasting harmful effects to aquatic life.

Signal Word: Danger

Precautionary Statements:

Prevention: P210: Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P261: Avoid breathing mists, sprays, fume. P264: Wash thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P280: Wear protective gloves/protective clothing/eye protection/face protection. P284: Wear respiratory protection.

Response: P370 + P378: In case of fire: Use materials appropriate for surrounding fire for extinction. P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor. P331: Do NOT induce vomiting. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P333 + P313: If skin irritation or rash occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. P337 + P313: If eye irritation persists: Get medical advice/attention. P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P342 + P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor. P321: Specific treatment (remove from exposure and treat symptoms).

Storage: P403 + P233: Store in a well-ventilated place. Keep container tightly closed. P405: Store locked up.

Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbols: GHS07, GHS08

16. OTHER INFORMATION (Continued)

REVISIONS DETAILS: November 16, 2018. Up-date entire SDS to include GHS compliance. Review of entire SDS for currency of exposure limits, regulatory compliance and other data.

REFERENCES AND DATA SOURCES: Contact the supplier for information.

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Bridging principles were used to classify this product.

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. • PO Box 1961, Hilo, HI 96721 • (800) 441-3365 • (808) 969-4846

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Preserva Wood assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Preserva Wood assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a SDS. 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 which have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances which 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. **B:** Substances which 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 which 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. **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.

PEL-Permissible Exposure Limit: 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.

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

STEL-Short Term Exposure Limit: 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: 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.

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. PII or Draize = "0". *Eye Irritation:* Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = "0". *Oral Toxicity LD₅₀ Rat:* < 5000 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC₅₀ Rat:* < 20 mg/L. **1 (Slight Hazard):** Minor reversible injury may occur; slightly or mildly irritating. *Skin Irritation:* Slightly or mildly irritating. *Eye Irritation:* Slightly or mildly irritating. *Oral Toxicity LD₅₀ Rat:* > 500-5000 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 1000-2000 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat:* > 2-20 mg/L. **2 (Moderate Hazard):** Temporary or transitory injury may occur. *Skin Irritation:* Moderately irritating; primary irritant; sensitizer. PII or Draize > 0, < 5. *Eye Irritation:* Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD₅₀ Rat:* > 50-500 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 200-1000 mg/kg. *Inhalation Toxicity LC₅₀ 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 destroy dermal tissue, cause skin burns, 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 LD₅₀ Rat:* > 1-50 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 20-200 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat:* > 0.05-0.5 mg/L. **4 (Severe Hazard):** Life-threatening; major or permanent damage may result from single or repeated exposure. *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 LD₅₀ Rat:* ≤ 1 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* ≤ 20 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat:* ≤ 0.05 mg/L).

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

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 require considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur, including: 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] (e.g. OSHA Class IIIB, or; 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 in air, including: Liquids having a flash-point at or above 37.8°C [100°F]; Solid materials in the form of coarse 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; Solids and semisolids 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, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 38°C [100°F] and below 37.8°C [100°F] [e.g. 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]; 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 which will burn readily, including: 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] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric].

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. *Unstable Compressed Gases:* No Rating. *Pyrophorics:* No Rating. *Oxidizers:* No "0" rating allowed. *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. *Explosives:* Division 1.5 & 1.6 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; *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 explosive hazard. 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 – Explosive substances where the explosive effect 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:* Packaging Group II *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. *Unstable Reactives:* Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential 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 1.2 – 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 *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. *Oxidizers:* *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 to cause significant heat generation or explosion.);

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD (continued): 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-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 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 whose LC₅₀ for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 2000 mg/kg. Materials whose LD₅₀ for acute oral toxicity is greater than 2000 mg/kg. Materials that are essentially non-irritating to the respiratory tract, eyes and skin. **1** (materials that, under emergency conditions, can cause significant irritation): Gases and vapors whose LC₅₀ for acute inhalation toxicity is greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 10 mg/L but less than or equal to 200 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials whose LD₅₀ for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. Materials that cause slight to moderate irritation to the respiratory tract, eyes and skin. **2** (materials that, under emergency conditions, can cause temporary incapacitation or residual injury): Gases and vapors whose LC₅₀ for acute inhalation toxicity is greater than 3,000 ppm but less than or equal to 5,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 2 mg/L but less than or equal to 10 mg/L. **HEALTH HAZARD (continued): 2 (continued):** Materials whose LD₅₀ for acute dermal toxicity is greater than 200 mg/kg but less than or equal to 1000 mg/kg. Materials whose LD₅₀ for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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. 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. **3** (materials that, under emergency conditions, can cause serious or permanent injury): Gases and vapors whose LC₅₀ for acute inhalation toxicity is greater than 1,000 ppm but less than or equal to 3,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials whose LD₅₀ for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. **4** (materials that, under emergency conditions, can be lethal): Gases and vapors whose LC₅₀ for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm.

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 accordance with Annex D. **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 accordance with Annex D. 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 Recommendation 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 percent 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 a 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). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. Most ordinary combustible materials. **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 in 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 percent 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 (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids).

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 3 (continued): 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 a 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 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **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 percent 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 estimated 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 estimated 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 estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100 W/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 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. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures.

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:

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. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. **Human and Animal Toxicology (continued):** Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LD₀₁**, or **TC**, **TC₀₁**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used.

Other 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.

REPRODUCTIVE TOXICITY INFORMATION:

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.

ECOLOGICAL INFORMATION:

EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL_m** = median threshold limit; Coefficient of Oil/Water Distribution is represented by $\log K_{ow}$ or $\log K_{oc}$ and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S. and CANADA: **ACGIH:** American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **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**). **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 Substances 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 which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration.