

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

<u>TRADE NAMES (AS LABELED):</u>	ProfilerPro Plate Kits 1 and 2
<u>CODE NUMBERS:</u>	PN 760373, PN 760374
<u>U.N. NUMBER:</u>	Not applicable
<u>U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:</u>	Not applicable
<u>HAZCHEM CODE (AUSTRALIA):</u>	Not applicable
<u>POISONS SCHEDULE NUMBER (AUSTRALIA):</u>	Not applicable
<u>PRODUCT USE:</u>	Laboratory Biological Research
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	Caliper Life Sciences
<u>ADDRESS:</u>	68 Elm Street Hopkinton, MA 01748 1-800-255-3924 (CHEM-TEL) in U.S., Canada, Puerto Rico, U.S. Virgin Islands
<u>EMERGENCY PHONE:</u>	+1-800-LAB-CHIP (toll-free) +1-800-522-2447 (toll-free) +1-508-435-3439 (outside North America)
<u>INFORMATION NUMBER:</u>	

2. COMPOSITION AND INFORMATION ON INGREDIENTS

This Material Safety Data sheet describes the ProfilerPro Plate Kit 1 and ProfilerPro Plate Kit 2. The ProfilerPro Plate Kit 1 consists of seventy-seven solutions. The ProfilerPro Plate Kit 2 consists of seventy-seven solutions. This Material Safety Data Sheet provides complete information on all the components described in the following tables. Unless otherwise specified, the information in each of the following sections (Sections 3–16) of this document is pertinent to each solution. These products are mixtures (preparations) of the following chemical components:

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
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COMPONENTS 1 & 2: DKP TERMINATION BUFFER IN PLATE KIT 1 AND PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	200-664-3	2-1553	3–7	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENTS 3 & 4: DKP RECONSTITUTION BUFFER IN PLATE KIT 1 AND PLATE KIT 2

Water and Other Non-Hazardous Ingredients					
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COMPONENTS 5 & 6: DITHIOTHREITOL SOLUTION, 1M IN PLATE KIT 1 AND PLATE KIT 2

Dithiothreitol	3483-12-3	222-468-7	NE	10–20	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENTS 7–37: DKP ENZYME REAGENTS 1–9 AND 11–24 IN ENZYME PLATE 1 IN PLATE KIT 1 AND DKP ENZYME REAGENTS 25–26, 35, 40, 43, AND 46–48 IN ENZYME PLATE 2 IN PLATE KIT 2

Glycerin	56-81-5	200-289-5	2-242	7–13	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENTS 38–42: DKP ENZYME REAGENTS 27, 34, 36, 38, AND 42 IN ENZYME PLATE 2 IN PLATE KIT 2

Glycerin	56-81-5	200-289-5	2-242	13–20	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENT 43: DKP ENZYME REAGENT 10 IN ENZYME PLATE 1 IN PLATE KIT 1

Glycerin	56-81-5	200-289-5	2-242	7–13	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENTS 44–50: DKP ENZYME REAGENTS 28, 30–31, 39, 41, AND 44–45 IN ENZYME PLATE 2 IN PLATE KIT 2

Water and Other Non-Hazardous Ingredients					
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COMPONENTS 51–53: DKP ENZYME REAGENTS 29 AND 32–33 IN ENZYME PLATE 2 IN PLATE KIT 2

Sodium Chloride	7647-14-5	231-598-3	1-236	1–5	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENT 54: DKP ENZYME REAGENT 37 in ENZYME PLATE 2 IN PLATE KIT 2

Sodium Chloride	7647-14-5	231-598-3	1-236	1–5	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Glycerin	56-81-5	200-289-5	2-242	10–20	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

NE = Not Established.

See Section 16 for Definitions of Terms Used.

2. COMPOSITION AND INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
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COMPONENTS 55–103: DKP SUBSTRATE REAGENTS 1–24 IN SUBSTRATE PLATE 1 IN PLATE KIT 1 AND DKP SUBSTRATE REAGENTS 25–48 IN SUBSTRATE PLATE 2 IN PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	200-664-3	2-1553	0.1–0.9	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENTS 104–152: DKP SUBSTRATE CONTROLS 1–24 IN SUBSTRATE PLATE 1 IN PLATE KIT 1 AND DKP SUBSTRATE CONTROLS 25–48 IN SUBSTRATE PLATE 2 IN PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	200-664-3	2-1553	0.1–0.9	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and Other Non-Hazardous Ingredients					

COMPONENT 153 & 154: PROTEASE INHIBITOR IN PLATE KIT 1 AND PLATE KIT 2

Water and Other Non-Hazardous Ingredients					
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NE = Not Established.

See Section 16 for Definitions of Terms Used.

NOTE: Unless otherwise indicated, the hazard assessments in the following sections are pertinent to all component reagents.

3. HAZARD IDENTIFICATION

EU LABELING AND CLASSIFICATION: (See Section 15 for definition of risk phrases, safety phrases and symbols.) According to Article 1 of European Union Council Directive 92/32/EEC, medical products in the finished state for human use (as defined by European Union Council Directives 67/548/EEC and 87/21/EEC) are not subject to the regulations and administrative provisions of European Union Council Directive 92/32/EEC.

Health Hazards:

DITHIOTHREITOL SOLUTION: Inhalation of vapors, mists, or sprays of this component may irritate the nose, throat, and lungs. Symptoms may include nausea, headache, and vomiting. Depending on the duration and concentration of overexposure, skin and eye contact may irritate contaminated tissue. Symptoms of skin overexposure may include redness and discomfort. Symptoms of eye overexposure may include redness, tearing, and pain. If this component is swallowed, it may irritate the mouth, throat, and other tissues of the digestive system.

DKP TERMINATION BUFFER: Inhalation of vapors, mists, or sprays of this product may irritate the nose, throat, and lungs and cause nausea, headache, and vomiting. Depending on the duration and concentration of overexposure, skin contact may cause redness and discomfort, and eye contact may cause redness, tearing, and pain. The Dimethyl Sulfoxide component of this product can be absorbed through the skin and may carry dissolved chemicals with it into the body. Symptoms of skin absorption for a prolonged period of time and a large area of skin may include redness, burning, itching, scaling, vision disturbance, photophobia, headache, and diarrhea. If this product is swallowed, it may cause gastric distress. Large doses may cause nausea, vomiting, chills, cramps, and lethargy. Chronic ingestion of the Dimethyl Sulfoxide component of this product may affect the liver and kidneys. The Dimethyl Sulfoxide component of this product can cause anaphylactic reaction by unspecified exposure routes; symptoms may include rash, abdominal cramps, nausea, chills, and chest pain.

DKP SUBSTRATE REAGENT, and DKP SUBSTRATE CONTROL: The Dimethyl Sulfoxide constituent of these components can be absorbed through the skin and may carry dissolved chemicals with it into the body. Symptoms of overexposure for a prolonged period of time and a large area of skin may include redness, burning, itching, scaling, vision disturbance, photophobia, headache, and diarrhea. The Dimethyl Sulfoxide component of this product can cause anaphylactic reaction by unspecified exposure routes; symptoms may include rash, abdominal cramps, nausea, chills, and chest pain.

ALL OTHER COMPONENTS: The chief hazard in event of overexposure is the potential for irritation of contaminated skin or eyes.

Flammability Hazards: The components of these products present no significant fire hazards. In the event of a fire, these products will not contribute significant additional hazards.

Reactivity Hazards: These products are not reactive.

Environmental Hazards: Negligible.

4. FIRST-AID MEASURES

Contaminated individuals must seek medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to physician or health professional with the contaminated individual.

SKIN EXPOSURE: If these products contaminate the skin, begin decontamination with copious amounts of running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Contaminated clothing must be removed and laundered before re-use. The contaminated individual must seek medical attention if any adverse effect develops after the area is flushed.

EYE EXPOSURE: If these products contaminate the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have the contaminated individual "roll" eyes. Minimum flushing is for 15 minutes. The contaminated individual must seek medical attention if adverse effects occur after flushing.

INHALATION: If vapors, mists or sprays from these products are inhaled, remove contaminated individual to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers. Seek medical attention if adverse effect continues after removal to fresh air.

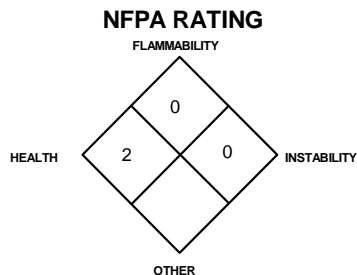
INGESTION: If These products are swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING unless directed by medical personnel. Have contaminated individual rinse mouth with water. Never induce vomiting or give diluents (milk or water) to someone who is 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. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing dermatitis, other skin conditions, respiratory conditions, and liver disorders may be aggravated by overexposure to components of these products.

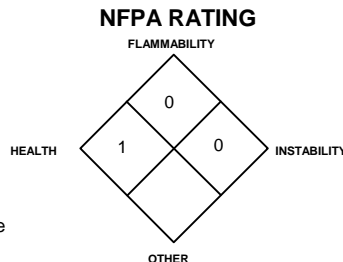
RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

DKP Termination Buffer



All Other Reagents



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

FLASH POINT: Not flammable.

AUTOIGNITION TEMPERATURE: Not applicable.

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

FIRE EXTINGUISHING MATERIALS: In the event of a fire, use suppression methods for surrounding materials: Water spray, alcohol-resistant foam, carbon dioxide, or dry chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, these products' components will decompose and produce irritating vapors and toxic gases (including carbon oxides, dimethyl amine, hydrogen sulfide, cyanides, sodium oxides, and nitrogen oxides).

SPECIAL FIRE-FIGHTING PROCEDURES: Do not use halogenated extinguishing media. Move containers from fire area if it can be done without risk to personnel. Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: For small releases take basic hygiene precautions. Lightweight gloves, a lab coat, and eye protection should be worn. Absorb spilled liquid with paper towels. Wash contaminated area with soap and water, absorb with paper towels, and rinse with water. Trained personnel using pre-planned procedures should respond to large releases that are not immediately controlled. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel. In the event of a non-incident release, minimum Personal Protective Equipment should be **Level D: lab-gloves, chemical resistant apron, boots, and splash goggles. Respiratory protection should not be necessary.** Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada, European EU Member States, Australia and its Provinces and those of Japan (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting these products' components ON YOU or IN YOU. Wash thoroughly after handling these products' components. Avoid splashing or spraying these products' components. Do not eat or drink while handling these products' components.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing vapors or mists generated by these products' components. Ensure containers of these products' components are properly labeled. Open containers slowly on a stable surface. Store vials as directed in the product insert. Keep vials tightly closed when not in use. Store away from incompatible materials. Inspect vials containing these products' components for leaks or damage. Read instructions provided with these products prior to use.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this section, if applicable. Ensure eyewash/safety shower stations are available near areas where these products are used.

EXPOSURE LIMITS/GUIDELINES:

NOTE: For Component Numbers not specifically listed, those components consist primarily of water and trace constituents-no exposure limits are applicable.

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR										
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	AIHA WELs		OTHER	
		TWA	STEL	TWA	STEL	TWA	STEL	IDLH	TWA	STEL	ppm	
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

COMPONENTS 1 & 2: DKP TERMINATION BUFFER IN PLATE KIT 1 AND PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	NE	NE	NE	NE	NE	NE	NE	NE	250	NE	NE
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COMPONENTS 7-37: DKP ENZYME REAGENTS 1-9 AND 11-24 IN ENZYME PLATE 1 IN PLATE KIT 1 AND DKP ENZYME REAGENTS 25-26, 35, 40, 43, AND 46-48 IN ENZYME PLATE 2 IN PLATE KIT 2

Glycerin (limits are for Glycerin mist)	56-81-5	10 ppm	NE	15 (Total dust) 5 (Resp. frac.) 10 (Total)	NE	NE	NE	NE	NE	NE	NE	NE
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NE = Not Established.

See Section 16 for Definitions of Terms Used.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/GUIDELINES (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR									
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	AIHA WEEELs		OTHER
		TWA ppm	STEL ppm	TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	TWA ppm	STEL ppm	ppm

COMPONENTS 38-42: DKP ENZYME REAGENTS 27, 34, 36, 38, AND 42 IN ENZYME PLATE 2 IN PLATE KIT 2

Glycerin (limits are for Glycerin mist)	56-81-5	10 ppm	NE	15 (Total dust) 5 (Resp. frac.) 10 (Total)	NE	NE	NE	NE	NE	NE	NE	NE
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COMPONENT 43: DKP ENZYME REAGENT 10 IN ENZYME PLATE 1 IN PLATE KIT 1

Glycerin (limits are for Glycerin mist)	56-81-5	10 ppm	NE	15 (Total dust) 5 (Resp. frac.) 10 (Total)	NE	NE	NE	NE	NE	NE	NE	NE
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COMPONENT 54: DKP ENZYME REAGENT 37 IN ENZYME PLATE 2 IN PLATE KIT 2

Glycerin (limits are for Glycerin mist)	56-81-5	10 ppm	NE	15 (Total dust) 5 (Resp. frac.) 10 (Total)	NE	NE	NE	NE	NE	NE	NE	NE
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COMPONENTS 55-103: DKP SUBSTRATE REAGENTS 1-24 IN SUBSTRATE PLATE 1 IN PLATE KIT 1 AND DKP SUBSTRATE REAGENTS 25-48 IN SUBSTRATE PLATE 2 IN PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	NE	NE	NE	NE	NE	NE	NE	NE	250	NE	NE
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COMPONENTS 104-152: DKP SUBSTRATE CONTROLS 1-24 IN SUBSTRATE PLATE 1 IN PLATE KIT 1 AND DKP SUBSTRATE CONTROLS 25-48 IN SUBSTRATE PLATE 2 IN PLATE KIT 2

Dimethyl Sulfoxide	67-68-5	NE	NE	NE	NE	NE	NE	NE	NE	250	NE	NE
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NE = Not Established. See Section 16 for Definitions of Terms Used.

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: Currently the following international exposure limits are in place for the some constituents of these products. Values given may not be the most current; individual country lists should be consulted to determine most current values available.

GLYCERIN:
 Australia: TWA = 10 mg/m³, JAN 1993
 Belgium: TWA = 10 mg/m³, JAN 1993
 Finland: TWA = 20 mg/m³, JAN 1999
 France: VME = 10 mg/m³, JAN 1999
 The Netherlands: MAC-TGG = 10 mg/m³, JAN 1999

GLYCERIN (continued):
 United Kingdom: TWA = 10 mg/m³, mist, SEP 2000
 In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV
DIMETHYL SULFOXIDE:
 Germany: No MAK Established, JAN 1999
 Russia: STEL = 20 mg/m³, JUN 2003

DIMETHYL SULFOXIDE (continued):
 Sweden: TWA = 50 ppm (150 mg/m³), KTV = 150 ppm (500 mg/m³), Skin, JAN 1999
 Switzerland: MAK-W = 50 ppm (160 mg/m³), Skin, JAN 1999
 The Netherlands: MAC-TGG = 150 mg/m³, Skin, 2003
SODIUM CHLORIDE:
 Russia: STEL = 5 mg/m³, JUN 2003

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 standard of Canada, Australia, Japan or standards of EU member states. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Respiratory protection is not generally needed when using these products. Maintain airborne contaminant concentrations below limits listed in this section. In instances where inhalable mists or sprays of product may be generated, and respiratory protection is necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, Canadian CSA Standard Z94.4-02, the European Standard EN 529:2005, and EU member states, or the Australian Standard 1716-Respiratory Protective Devices, the Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices, as well as requirements of Japan. 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, SAR with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

EYE PROTECTION: Depending on the use of these products, splash goggles or safety glasses may be worn. Use goggles or safety glasses for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to U.S. OSHA 29 CFR 1910.133, the European Standard CR 13464:1999 and the Canadian CSA Standard Z94.3-02, *Industrial Eye and Face Protectors*, the Australian Standard 1337-Eye Protection for Industrial Applications and Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment, as well as requirements of Japan for further information.

HAND PROTECTION: Wear butyl rubber, neoprene, or nitrile rubber or latex gloves for routine use. If necessary, refer to U.S. OSHA 29 CFR 1910.138 appropriate Standards of Canada, the European Standard CEN/TR 15419:2006 or the Australian Standard 2161-Industrial Safety Gloves and Mittens, and applicable Standards of Japan, for further information.

BODY PROTECTION: Use body protection appropriate for task, such as a lab coat. If necessary, use body protection appropriate for task (e.g., Tyvek suit, rubber apron). If necessary, refer appropriate Standards of Canada, the European Standard CEN/TR 15419:2006 the to Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals, or Japan 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 Z195-02, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

FOR ALL COMPONENTS UNLESS OTHERWISE INDICATED:

RELATIVE VAPOR DENSITY (air = 1): Not established.
EVAPORATION RATE (nBuAc = 1): Similar to water.
SPECIFIC GRAVITY (water = 1): Not established.

FREEZING/MELTING POINT: Not established.
BOILING POINT: Not established.
SOLUBILITY IN WATER: Completely soluble.

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

FOR DITHIOTHREITOL SOLUTION:

VAPOR PRESSURE, mm Hg @ 20°C: Not established.

pH: Not established.

LOG WATER/OIL DISTRIBUTION COEFFICIENT: Not established.

ODOR THRESHOLD: Not established.

APPEARANCE AND COLOR: These components are clear, colorless solutions with a mildly sulfurous odor.

HOW TO DETECT THIS SUBSTANCE: The odor may act as a warning property associated with this component.

FOR DKP TERMINATION BUFFER, DKP SUBSTRATE REAGENT, and DKP SUBSTRATE CONTROL:

VAPOR PRESSURE, mm Hg @ 20°C: Not established.

pH: Not established.

LOG WATER/OIL DISTRIBUTION COEFFICIENT: Not available.

ODOR THRESHOLD: Not available.

APPEARANCE AND COLOR: Clear, colorless liquid with a mildly garlic-like odor.

HOW TO DETECT THIS SUBSTANCE: The odor may act as a warning property associated with these components.

FOR ALL OTHER COMPONENTS:

VAPOR PRESSURE, mm Hg @ 20°C: Not established.

pH: 6.0–10.7

LOG WATER/OIL DISTRIBUTION COEFFICIENT: Not available.

ODOR THRESHOLD: Not available.

APPEARANCE, ODOR and COLOR: Clear, odorless, colorless liquids.

HOW TO DETECT THIS SUBSTANCE: There are no unusual warning properties associated with these components.

10. STABILITY AND REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of these products' components may produce carbon oxides, dimethyl amine, hydrogen sulfide, cyanides, sodium oxides, and nitrogen oxides.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:

DKP TERMINATION BUFFER, DKP SUBSTRATE REAGENTS, and DKP SUBSTRATE CONTROLS: Strong oxidizers, acetyl chloride, cyanuric chloride, acid chlorides, phosphorus halides, strong acids, strong reducers, substances that are incompatible with water.

ALL OTHER COMPONENTS: Strong oxidizers, strong acids, some metals, substances that are incompatible with water.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Any conditions that are incompatible with water, mixing these products with incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following information is available for the constituents in constituents in these products present in greater than 1 percent concentration and listed in Section 2 (Composition and Information on Ingredients). Only human data and LD₅₀ Oral-Rat, LD₅₀ Oral-Mouse, and irritancy data are provided. Other data are available, but are not provided in this MSDS:

DIMETHYL SULFOXIDE:

TDLo (intravenous, man) = 606 mg/kg;
Gastrointestinal: nausea or vomiting; Liver: jaundice, other or unclassified

LD₅₀ (oral, rat) = 14500 mg/kg; Sense Organs and Special Senses (Eye): hemorrhage; Sense Organs and Special Senses (Eye): conjunctive irritation

DIMETHYL SULFOXIDE (continued):

LD₅₀ (oral, mouse) = 7920 mg/kg

GLYCERIN:

DNA Inhibition (human, lymphocyte) = 200 mmol/L

LD₅₀ (oral, rat) = 12600 mg/kg; general anesthetic, muscle weakness, Liver: other changes
LD₅₀ (oral, mouse) = 4090 mg/kg

SODIUM CHLORIDE:

TDLo (intraplacental, woman) = 27 mg/kg/15 weeks pregnant; Reproductive effects

TDLo (oral, human) = 12,357 mg/kg/23 days/continuous; Cardiovascular effects

LD₅₀ (oral, rat) = 3000 mg/kg

LD₅₀ (oral, mouse) = 4000 mg/kg

SUSPECTED CANCER AGENT: The constituents in the components of these products are not found on the following lists: NTP, IARC, FEDERAL OSHA Z-List, and CAL-OSHA and therefore are neither considered to be nor suspected to be cancer causing agents by these agencies.

IRRITANCY OF PRODUCT:

DITHIOTHREITOL SOLUTION and DKP TERMINATION BUFFER: Depending on the duration and concentration of overexposure, skin and eye contact can irritate contaminated tissue.

ALL OTHER COMPONENTS: Contact with the skin or eyes may cause mild irritation, which is alleviated upon rinsing.

SENSITIZATION TO THE PRODUCT: The components of these products are not known to cause skin or respiratory sensitization.

DKP TERMINATION BUFFER, DKP SUBSTRATE REAGENTS, and DKP SUBSTRATE CONTROLS: The Dimethyl Sulfoxide constituents in these components can cause anaphylactic reaction by unspecified exposure routes; symptoms may include rash, abdominal cramps, nausea, chills, and chest pain.

ALL OTHER COMPONENTS: All other components of these products are not known to cause skin or respiratory sensitization.

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

Mutagenicity: The constituents in the components in these products are not reported to produce mutagenic effects in humans. Human mutation data are available for the Dimethyl Sulfoxide and Glycerin constituents in these products' components; these data were obtained during clinical studies on specific human tissues exposed to high doses of these compounds.

Embryotoxicity: The constituents in the components in these products are not reported to cause human embryotoxic effects.

Teratogenicity: The constituents in the components in these products are reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Dimethyl Sulfoxide constituent in these products' components, indicate teratogenic effects.

Reproductive Toxicity: The constituents in the components in these products are not reported to cause adverse reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Dimethyl Sulfoxide and Glycerin constituents in these products' components indicate adverse 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 *embryotoxin* is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance that interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES: Currently, there are no Biological Exposure Indices (BEIs) determined for the constituents in these products' components.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of these products will degrade in the environment into smaller organic and inorganic constituents. Additional environmental data for components are available as follows:

DIMETHYL SULFOXIDE:

Biological Half-Life: Dermal application resulted in 50-60 mg % in blood in 4-8 hr; half-life 11-14 hr. 220-340 mg % reported following oral admin of 1,000 mg/kg; half-life 20 hours.

Biodegradation: No degradation of Dimethyl Sulfoxide (%) was noted in a screening test using an activated sludge inoculum. Dimethyl Sulfoxide is considered to be very difficult to degrade in water, based on available data. The data used to make this classification were not indicated. A variety of microorganisms, including some that are found in anaerobic lake mud, have the ability to transform Dimethyl Sulfoxide to dimethyl sulfide.

GLYCERIN:

Water Solubility = Miscible. Log K_{ow} = -1.76. 5-Day Biological Oxygen Demand = 0.54 p/p; 10 day BOD = 0.98 p/p; 20 Day BOD = 1.0 p/p:

Terrestrial Fate: If released to soil, glycerin is expected to undergo rapid biodegradation under aerobic conditions. Biodegradation is also expected under anaerobic condition.

Based on its Log K_{ow} of -1.76 and its water solubility, the soil absorption coefficients for glycerin can be estimated at 3 and 2, respectively, using regression-derived equations. These values indicated that glycerin will be highly mobile in soil. Glycerin is not expected to significantly volatilize from moist or dry soil to the atmosphere.

Aquatic Fate: If released to an aquatic environment, glycerin is expected to rapidly degrade under aerobic conditions. Degradation is also likely in seawater and under anaerobic conditions. Based on water solubility and its Log K_{ow} , the bio-concentration factors for glycerin can be estimated at 3 and 0.2, respectively. These values indicate that bio-concentration is not significant in aquatic organisms.

Atmospheric Fate: If released to the atmosphere, glycerin may undergo a gas-phase oxidation with photochemically produced hydroxyl radicals. An estimated reaction rate indicates that the atmospheric half-life of glycerin in the atmosphere to be 33 hours. The water solubility of glycerin indicates that it may also undergo atmospheric removal by wet deposition processes.

SODIUM CHLORIDE:

Water solubility = 37 g/ 100 mL @ 0°C; 39.12 g/100 ml of water @ 100°C; Log K_{ow} = -3.0

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Release of large quantities of these products' components into the environment may have adverse effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: Release of large quantities of these products' components into an aquatic environment may have adverse effects on aquatic plants or animals. Additional aquatic toxicity data are available as follows:

DIMETHYL SULFOXIDE:

T_{lm} (bluegill) 48 hours = 33,500 ppm; fresh water

EC₀ (*Pseudomonas putida* bacteria) 16 hours = >10,000 mg/L

EC₀ (*Microcystis aeruginosa* algae) 8 days = 2,900 mg/L

EC₀ (*Scenedesmus quadricauda* green algae) 7 days = > 10,000 mg/L

LC₅₀ (goldfish) 24 hours = > 5,000 mg/

GLYCERIN (continued):

EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 3,200 mg/L

EC₀ (*Uronema parduczi* Chatton-Lwoff protozoa) = > 10,000 mg/L

SODIUM CHLORIDE:

LC₅₀ (*Carassius auratus* goldfish) 240 hours = 11,764.3 mg/L (@ 23.5°C, tap water, static bioassay)

LC₅₀ (*Tinca tinca* tench) 12 hours = 112 mg/L @ 25°C, freshwater, static bioassay)

SODIUM CHLORIDE (continued):

LC₅₀ (*Tinca tinca* tench) 12 hours = 1142 mg/L @ 20°C, freshwater, static bioassay)

LC₅₀ (*Tinca tinca* tench) 24 hours = 119 mg/L @ 25°C, freshwater, static bioassay)

LC₅₀ (*Tinca tinca* tench) 24 hours = 104 mg/L @ 20°C, freshwater, static bioassay)

EC₅₀ (*Daphnia magna* water flea) 48 hours = 340.7-469.2 mg/L s.c. (11.5-14.5°C, well water, static bioassay)

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Do NOT dispose of any component of these products by pouring down the drain. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. These products, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

U.S. EPA WASTE NUMBER: Not applicable.

14. TRANSPORTATION INFORMATION

THESE PRODUCTS ARE NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: These products are not classified as dangerous goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION DESIGNATION: These products are not classified as dangerous goods, per rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO): These products are not classified as dangerous goods, per rules of the IMO.

Marine Pollutant: No component of these products is designated by the IMO to be a Marine Pollutant.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): These products are not classified by the United Nations Economic Commission for Europe to be dangerous goods.

AUSTRALIAN CODE FOR THE TRANSPORTATION OF DANGEROUS GOODS BY ROAD AND RAIL (ADG CODE): These products are not classified by the National Road Transport Commission (NRTC) to be dangerous goods.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The constituents in components of these products are not subject to Sections 302, 304, and 313 reporting requirements under the Superfund Amendment and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the constituents in components of these products. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: These products are regulated by the Food and Drug Administration; it is exempt from the requirements of TSCA.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of these products is on the California Proposition 65 lists.

15. REGULATORY INFORMATION (Continued)

ADDITIONAL U.S. REGULATIONS (continued):

ANSI LABELING (Z129.1; Provided to Summarize Occupational Hazard Information):

FOR DKP TERMINATION BUFFER, DKP SUBSTRATE REAGENTS, and DKP SUBSTRATE CONTROLS: **CAUTION!** MAY CAUSE SENSITIZATION BY UNSPECIFIED ROUTE OF EXPOSURE. MAY CAUSE SKIN, EYE, AND RESPIRATORY TRACT IRRITATION. MAY CAUSE DISCOMFORT IF SWALLOWED. Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

ALL OTHER SOLUTIONS: **CAUTION!** MAY CAUSE SKIN, EYE, AND RESPIRATORY TRACT IRRITATION. MAY CAUSE DISCOMFORT IF SWALLOWED. Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: The constituents in components of these products are listed on the DSL Inventory or are exempt.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: The constituents in components of these products are not on the CEPA Priority Substances Lists.

CANADIAN WHMIS CLASSIFICATION AND SYMBOLS: Not applicable.

DKP TERMINATION BUFFER: D2B Materials Causing Other Toxic Effects (Contains sensitizer in greater than 1%)



ALL OTHER COMPONENTS: Not applicable.

EUROPEAN UNION INFORMATION:

EU LABELING AND CLASSIFICATION: (See Section 15 for definition of risk phrases, safety phrases and symbols.) According to Article 1 of European Union Council Directive 92/32/EEC, medical products in the finished state for human use (as defined by European Union Council Directives 67/548/EEC and 87/21/EEC) are not subject to the regulations and administrative provisions of European Union Council Directive 92/32/EEC.

FOR CONSTITUENTS:

Dimethyl Sulfoxide:

An official classification for this substance has not been published in Commission Directives 93/72/EEC, 94/69/EC, 96/56/EC, or 98/98/EC.

Dithiothreitol:

An official classification for this substance has not been published in Commission Directives 93/72/EEC, 94/69/EC, 96/56/EC, or 98/98/EC.

Glycerin:

An official classification for this substance has not been published in Commission Directives 93/72/EEC, 94/69/EC, 96/56/EC, or 98/98/EC.

Sodium Chloride:

An official classification for this substance has not been published in Commission Directives 93/72/EEC, 94/69/EC, 96/56/EC, or 98/98/EC.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: The components of these products are listed on the AICS or are exempt.

LIST OF DESIGNATED SUBSTANCES: Not applicable.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

LABELING AND CLASSIFICATION: The components of these products do not meet the definition of any hazard class.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE ENCS: The constituents in components of these products are on the ENCS Inventory as indicated in composition tables in Section 2 (Composition and Information on Ingredients).

POISONOUS AND DELETERIOUS SUBSTANCES CONTROL LAW: No constituent in the components of these products is a listed Specified Poisonous Substance under the Poisonous and Deleterious Substances Control Law.

16. OTHER INFORMATION

PREPARED BY:

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