

MATERIAL SAFETY DATA SHEET

MSDS DATE:07/24/08

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: KARNOVSKY'S FIXATIVE
SYNONYMS: N/A
PRODUCT CODES: 15720

MANUFACTURER: ELECTRON MICROSCOPY SCIENCES
DIVISION: 1560 INDUSTRY ROAD/P.O. BOX 550
ADDRESS: HATFIELD, PA 19440

EMERGENCY PHONE: 215-412-8400
CHEMTREC PHONE: 800-424 -9300

FAX PHONE: 215-412-8450

CHEMICAL NAME: N/A
CHEMICAL FAMILY: N/A

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT:	CAS NO.	%VOL
GLUTARALDEHYDE	111-30-8	4%
SODIUM PHOSPHATE	7778-77-0	50%
FORMALDEHYDE	50-00-0	3.2%
WATER	7732-18-5	BALANCE

	<u>ppm</u>	<u>mg/m3</u>
OSHA PEL-TWA:	200	260
OSHA PEL STEL :	N/A	N/A
OSHA PEL CEILING:	N/A	N/A

ACGIH TLV-TWA:	200	N/A
ACGIH TLV STEL:	250	N/A
ACGIH TLV CEILING:	0.5	N/A

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

ROUTES OF ENTRY:EYES, SKIN, INHALATION, INGESTION

POTENTIAL HEALTH EFFECTS

EYES: MAY CAUSE SEVERE IRRITATION WITH CORNEAL INJURY WHICH MAY RESULT IN PERMANENT IMPAIRMENT OF VISION, EVEN BLINDNESS. CHEMICAL BURNS MAY OCCUR. VAPOR MAY CAUSE EYE IRRITATION EXPERIENCED AS MILD DISCOMFORT AND REDNESS.

SKIN: CONTACT- BRIEF CONTACT MAY CAUSE SKIN IRRITATION WITH LOCAL REDNESS. PROLONGED CONTACT MAY CAUSE SEVERE SKIN BURNS. SYMPTOMS MAY INCLUDE PAIN, SEVERE LOCAL REDNESS, SWELLING, AND TISSUE DAMAGE. MAY STAIN SKIN. MAY CAUSE ITCHING.

ABSORPTION: HARMFUL IF ABSORBED THROUGH SKIN

SENSITIZATION: SKIN CONTACT MAY CAUSE AN ALLERGIC SKIN REACTION IN A SMALL PROPORTION OF INDIVIDUALS. HAS CAUSED ALLERGIC SKIN REACTIONS WHEN TESTED IN GUINEA PIGS. HAS CAUSED ALLERGIC SKIN REACTIONS WHEN TESTED IN MICE. INHALATION OF VAPORS MAY RESULT IN SKIN SENSITIZATION. IN SENSITIZED INDIVIDUALS, REEXPOSURE TO VERY SMALL AMOUNTS OF VAPOR, MIST, OR LIQUID MAY CAUSE A SEVERE ALLERGIC SKIN REACTION.

INGESTION: MAY BE FATAL IF SWALLOWED. ORAL TOXICITY OF GLUTARALDEHYDE INCREASES WITH DILUTION. DRINKING WATER FOLLOWING INGESTION OF CONCENTRATED GLUTARALDEHYDE SOLUTIONS CAN ENHANCE THE TOXICITY OF GLUTARALDEHYDE. SWALLOWING MAY RESULT IN IRRITATION OR BURNS OF THE MOUTH, THROAT AND GASTROINTESTINAL TRACT. SWALLOWING MAY RESULT IN GASTROINTESTINAL IRRITATION OR ULCERATION. EXCESSIVE EXPOSURE MAY CAUSE HEADACHE, DIZZINESS, ANESTHESIA, DROWSINESS, UNCONSCIOUSNESS AND OTHER CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DEATH. ASPIRATION INTO THE LUNGS MAY OCCUR DURING INGESTION OR VOMITING , CAUSING TISSUE DAMAGE OR LUNG INJURY

INHALATION: VAPOR MAY CAUSE SEVERE IRRITATION OF THE UPPER RESPIRATORY TRACT (NOSE AND THROAT). VAPOR FROM HEATED MATERIAL MAY CAUSE SERIOUS ADVERSE EFFECTS, EVEN DEATH. CASE REPORTS AND MEDICAL SURVEYS

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LINK ASTHMA AND RESPIRATORY IRRITATION TO GLUTARALDEHYDE EXPOSURE, PRIMARILY IN MEDICAL PERSONNEL. ASTHMA-LIKE SYMPTOM MAY OCCUR IN PEOPLE PRONE TO RESPIRATORY DISORDERS OR OTHER ALLERGIES. ASTHMA-LIKE SYMPTOMS MAY INCLUDE COUGHING, DIFFICULT BREATHING AND A FEELING OF TIGHTNESS IN THE CHEST. OCCASIONALLY, BREATHING DIFFICULTIES MAY BE LIFE THREATENING.

ACUTE HEALTH HAZARDS: MAY CAUSE NAUSEA AND VOMITING

CHRONIC HEALTH HAZARDS: REPEATED SKIN CONTACT MAY RESULT IN ABSORPTION OF AMOUNTS WHICH COULD CAUSE DEATH. HAS BEEN TOXIC TO THE FETUS IN LAB ANIMALS AT DOSES TOXIC TO THE MOTHER.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: EXCESSIVE EXPOSURE MAY AGGRAVATE PREEXISTING ASTHMA AND OTHER RESPIRATORY DISORDERS (E.G. EMPHYSEMA, BRONCHITIS, REACTIVE AIRWAYS DYSFUNCTION SYNDROME).

CARCINOGENICITY

OSHA: N/A

ACGIH: N/A

NTP: N/A

IARC: N/A

OTHER: N/A

SECTION 4: FIRST AID MEASURES

EYES: FLUSH WITH WATER FOR AT LEAST 30 MINUTES. REMOVE CONTACT LENSES AFTER THE FIRST 5 MINUTES AND CONTINUE WASHING. OBTAIN PROMPT MEDICAL CONSULTATION PREFERABLY FROM AN OPHTHALMOLOGIST

SKIN: TAKE OFF CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER FOR 15 TO 20 MINUTES. CALL A POISON CONTROL CENTER OR DOCTOR FOR TREATMENT ADVICE. WASH CLOTHING BEFORE REUSE. SHOES AND OTHER LEATHER ITEMS WHICH CANNOT BE DECONTAMINATED SHOULD BE DISPOSED OF PROPERLY. FIRST AID RESPONDERS SHOULD PAY ATTENTION TO SELF-PROTECTION AND USE THE RECOMMENDED PROTECTIVE CLOTHING (CHEMICAL RESISTANT GLOVES, SPLASH PROTECTION)

INGESTION: IMMEDIATELY CALL A POISON CONTROL CENTER OR DOCTOR. DO NOT INDUCE VOMITING UNLESS TOLD TO DO SO BY A POISON CONTROL CENTER OR DOCTOR. DO NOT GIVE ANY LIQUID TO THE PERSON. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

INHALATION: MOVE PERSON TO FRESH AIR. IF PERSON IS NOT BREATHING, CALL AN EMERGENCY RESPONDER OR AMBULANCE, THEN GIVE ARTIFICIAL RESPIRATION; IF BY MOUTH TO MOUTH USE RESCUER PROTECTION (POCKET MASK ETC). CALL POISON CONTROL CENTER OR DOCTOR FOR TREATMENT ADVICE. IF BREATHING IS DIFFICULT, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: PROBABLY MUCOSAL DAMAGE MAY CONTRAINDICATE THE USE OF GASTRIC LAVAGE. DUE TO IRRITANT PROPERTIES, SWALLOWING MAY RESULT IN BURNS/ULCERATION OF MOUTH, STOMACH AND LOWER GASTROINTESTINAL TRACT WITH SUBSEQUENT STRICTURE. ASPIRATION OF VOMITUS MAY CAUSE LUNG INJURY. SUGGEST ENDOTRACHEAL/ESOPHAGEAL CONTROL OF LAVAGE IS DONE. MAY CAUSE ASTHMA-LIKE (REACTIVE AIRWAYS) SYMPTOMS. BRONCHODILATORS, EXPECTORANTS AND ANTITUSSIVES MAY BE OF HELP. GLUTARALDEHYDE MAY TRANSIENTLY WORSEN REVERSIBLE AIRWAYS OBSTRUCTION INCLUDING ASTHMA OR REACTIVE AIRWAYS DISEASE. MAINTAIN ADEQUATE VENTILATION AND OXYGENATION OF THE PATIENT. TREAT BRONCHOSPASM WITH INHALED BETA2 AGONIST AND ORAL OR PARENTERAL CORTICOSTEROIDS. CHEMICAL EYE BURNS MAY REQUIRE EXTENDED IRRIGATION. OBTAIN PROMPT CONSULTATION, PREFERABLY FROM AN OPHTHALMOLOGIST. INHALATION OF VAPORS MAY RESULT IN SKIN SENSITIZATION. IN SENSITIZED INDIVIDUALS, REEXPOSURE TO VERY SMALL AMOUNTS OF VAPOR, MIST, OR LIQUID MAY CAUSE A SEVERE ALLERGIC SKIN REACTION. IF BURN IS PRESENT. TREAT AS ANY THERMAL BURN, AFTER DECONTAMINATION. FIRST AID RESPONDERS SHOULD PAY ATTENTION TO SELF-PROTECTION AND USE THE RECOMMENDED PROTECTIVE CLOTHING (CHEMICAL RESISTANT GLOVES, SPLASH PROTECTION) NO SPECIFIC ANTIDOTE. TREATMENT OF EXPOSURE SHOULD BE DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION OF THE PATIENT

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE LIMITS IN AIR, UPPER: N/A
(% BY VOLUME) LOWER: N/A

FLASH POINT: N/A
F: N/A

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C: N/A
METHOD USED: N/A

AUTOIGNITION TEMPERATURE: N/A
F: N/A
C: N/A

NFPA HAZARD CLASSIFICATION

HEALTH: 3 FLAMMABILITY: 1 REACTIVITY: 0
OTHER: N/A

HMIS HAZARD CLASSIFICATION

HEALTH: N/A FLAMMABILITY: N/A REACTIVITY: N/A
PROTECTION: N/A

EXTINGUISHING MEDIA: TO EXTINGUISH COMBUSTIBLE RESIDUES OF THIS PRODUCT USE WATER FOG, CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: KEEP PEOPLE AWAY. ISOLATE FIRE AND DENY UNNECESSARY ENTRY. TO EXTINGUISH COMBUSTIBLE RESIDUES OF THIS PRODUCT USE WATER FOG, CARBON DIOXIDE, DRY CHEMICAL OR FOAM. CONTAIN FIRE WATER RUN-OFF IF POSSIBLE. FIRE WATER RUN-OFF, IF NOT CONTAINED, MAY CAUSE ENVIRONMENTAL DAMAGE. REVIEW THE "ACCIDENTAL RELEASE MEASURES" AND THE "ECOLOGICAL INFORMATION" SECTIONS OF THIS MSDS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: THIS MATERIAL WILL NOT BURN UNTIL THE WATER HAS EVAPORATED. RESIDUE CAN BURN.

HAZARDOUS DECOMPOSITION PRODUCTS: UNDER FIRE CONDITIONS SOME COMPONENTS OF THIS PRODUCT MAY DECOMPOSE. THE SMOKE MAY CONTAIN UNIDENTIFIED TOXIC AND/OR IRRITATING COMPOUNDS. COMBUSTION PRODUCTS MAY INCLUDE AND ARE NOT LIMITED TO: CARBON MONOXIDE. CARBON DIOXIDE.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: CONTAIN SPILLED MATERIAL IF POSSIBLE. COLLECT IN SUITABLE AND PROPERLY LABELED CONTAINERS. VERY LOW CONCENTRATIONS (5 PPM OR LESS OF GLUTARALDEHYDE) CAN BE DEGRADED IN A BIOLOGICAL WASTEWATER TREATMENT SYSTEM. THUS, SMALL SPILLS CAN BE FLUSHED WITH LARGE QUANTITIES OF WATER. LARGE QUANTITIES OR 'SLUGS' CAN BE HARMFUL TO THE TREATMENT SYSTEM. THUS LARGE SPILLS SHOULD BE COLLECTED FOR DISPOSAL. IT MAY ALSO BE POSSIBLE TO DECONTAMINATE SPILLED MATERIAL HEAT AND FUMES CAN BE LIBERATED BY THE DECONTAMINATION REACTION. SEE SECTION 13, DISPOSAL CONSIDERATIONS, FOR ADDITIONAL INFORMATION

PERSONAL PRECAUTIONS: USE APPROPRIATE SAFETY EQUIPMENT. FOR ADDITIONAL INFORMATION REFER TO SECTION 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. EVACUATE AREA. KEEP UPWIND OF SPILL. VENTILATE AREA OF LEAK OR SPILL. ONLY TRAINED AND PROPERLY PROTECTED PERSONNEL MUST BE INVOLVED IN CLEAN-UP OPERATIONS. REFER TO SECTION 7, HANDLING, FOR ADDITIONAL PRECAUTIONARY MEASURES.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID BREATHING VAPOR. DO NOT SWALLOW. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. WEAR GOGGLES, PROTECTIVE CLOTHING AND BUTYL OR NITRILE GLOVES. WASH HANDS THOROUGHLY WITH SOAP AND WATER AFTER HANDLING. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. DO NOT STORE IN: ALUMINUM, CARBON STEEL. COPPER. MILD STEEL. IRON. PLEASE REFER TO THE DOW PUBLICATION: GLUTARALDEHYDE. SAFE HANDLING AND STORAGE GUIDE; FORM NO. 253-01338
SHELF LIFE: USE WITHIN 12 MONTHS

OTHER PRECAUTIONS: DO NOT SPRAY OR AEROSOLIZE THE UNDILUTED FORM OF THE PRODUCT. FULL PERSONAL PROTECTIVE EQUIPMENT (INCLUDING SKIN COVERING AND FULL-FACE SCBA RESPIRATOR) IS REQUIRED FOR DILUTIONS OR MIXTURES OF THE PRODUCT USED IN A SPRAY APPLICATION.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

VENTILATION: PROVIDE GENERAL AND/OR LOCAL EXHAUST VENTILATION TO CONTROL AIRBORNE LEVELS BELOW THE EXPOSURE GUIDELINES.

RESPIRATORY PROTECTION: ATMOSPHERIC LEVELS SHOULD BE MAINTAINED BELOW THE EXPOSURE GUIDELINE. WHEN RESPIRATORY PROTECTION IS REQUIRED FOR CERTAIN OPERATIONS, USE AN APPROVED AIR-PURIFYING RESPIRATOR. THIS PRODUCT IS A RESPIRATORY IRRITANT. IF DISCOMFORT IS EXPERIENCED VENTILATION IS NOT ADEQUATE AND AN APPROVED FULL FACE AIR-PURIFYING RESPIRATOR IS RECOMMENDED. IF VAPORS ARE STRONG ENOUGH TO BE IRRITATING TO THE NOSE OR EYES, THE OEL IS PROBABLY BEING EXCEEDED. SPECIAL VENTILATION OR RESPIRATORY PROTECTION MAY BE REQUIRED. FOR OPERATIONS SUCH AS SPRAYING AND OTHER CONDITIONS SUCH AS EMERGENCIES WHERE THE EXPOSURE GUIDELINE MAY BE GREATLY EXCEEDED, USE AN APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS. FOR EMERGENCY RESPONSE OR FOR SITUATIONS WHERE THE ATMOSPHERIC LEVEL IS UNKNOWN, USE AN APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE-PRESSURE AIR LINE WITH AUXILIARY SELF-CONTAINED AIR SUPPLY. THE FOLLOWING SHOULD BE EFFECTIVE TYPES OF AIR-PURIFYING RESPIRATORS: FULL-FACE ORGANIC VAPOR CARTRIDGE WITH A PARTICULATE PRE-FILTER.

EYE PROTECTION: USE CHEMICAL GOGGLES. IF EXPOSURE CAUSES EYE DISCOMFORT, USE A FULL-FACE RESPIRATOR. USE A FULL-FACE RESPIRATOR WHEN MATERIAL IS HEATED OR WHEN AEROSOLS/MISTS ARE GENERATED. EYE WASH FOUNTAIN SHOULD BE LOCATED IN IMMEDIATE WORK AREA.

SKIN PROTECTION: USE PROTECTIVE CLOTHING CHEMICALLY RESISTANT TO THIS MATERIAL. SELECTION OF SPECIFIC ITEMS SUCH AS FACE SHIELD, BOOTS, APRON, OR FULL BODY SUIT WILL DEPEND ON THE TASK. SAFETY SHOWER SHOULD BE LOCATED IN IMMEDIATE WORK AREA. REMOVE CONTAMINATED CLOTHING IMMEDIATELY. WASH SKIN ARE WITH SOAP AND WATER, AND LAUNDRY CLOTHING BEFORE REUSE OR DISPOSE OF PROPERLY. ITEMS WHICH CANNOT BE DECONTAMINATED, SUCH AS SHOES, BELTS AND WATCHBANDS, SHOULD BE REMOVED AND DISPOSED OF PROPERLY. USE GLOVES CHEMICALLY RESISTANT TO THIS MATERIAL. EXAMPLES OF PREFERRED GLOVE BARRIER MATERIALS INCLUDE: BUTYL RUBBER. EXAMPLES OF ACCEPTABLE GLOVE BARRIER MATERIALS INCLUDE: NITRILE/BUTADIENE RUBBER ("NITRILE" OR "NBR") NOTICE: THE SELECTION OF A SPECIFIC GLOVE FOR A PARTICULAR APPLICATION AND DURATION OF USE IN A WORKPLACE SHOULD ALSO TAKE INTO ACCOUNT ALL RELEVANT WORKPLACE FACTORS SUCH AS, BUT NOT LIMITED TO: OTHER CHEMICALS WHICH MAY BE HANDLED, PHYSICAL REQUIREMENTS (CUT/PUNCTURE PROTECTION, DEXTERITY, THERMAL PROTECTION),POTENTIAL BODY REACTIONS TO GLOVE MATERIALS, AS WELL AS THE INSTRUCTIONS/SPECIFICATIONS PROVIDED BY THE GLOVE SUPPLIER.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:N/A

WORK HYGIENIC PRACTICES: WASH THOROUGHLY AFTER HANDLING. WASH CLOTHING BEFORE REUSE.

EXPOSURE GUIDELINES: N/A

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: CLEAR

ODOR: FRUITY

PHYSICAL STATE: LIQUID

pH AS SUPPLIED: 3.1- 4.5

pH (Other): N/A

BOILING POINT:

F: 213.3 DEG

C: 100.7 DEG

MELTING POINT: N/A

F: N/A

C: N/A

FREEZING POINT:

F: 0 DEG

C: -18 DEG

VAPOR PRESSURE (mmHg): N/A

@

F: N/A

C: N/A

VAPOR DENSITY (AIR = 1): 1.1

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F: N/A
C: N/A

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F: N/A
C: N/A

EVAPORATION RATE:

BASIS (=1): 1.0

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (con't)

SOLUBILITY IN WATER: YES

PERCENT SOLIDS BY WEIGHT: 100%

PERCENT VOLATILE:

BY WT/ BY VOL @

F: N/A
C: N/A

VOLATILE ORGANIC COMPOUNDS (VOC): N/A

WITH WATER: N/A LBS/GAL
WITHOUT WATER: N/A LBS/GAL

MOLECULAR WEIGHT: N/A

VISCOSITY:

@

F: N/A
C: N/A

SECTION 10: STABILITY AND REACTIVITY

STABILITY: THERMALLY STABLE AT TYPICAL USE TEMPERATURES

CONDITIONS TO AVOID (STABILITY): ACTIVE INGREDIENT DECOMPOSES AT ELEVATED TEMPERATURES

INCOMPATIBILITY (MATERIAL TO AVOID): AVOID CONTACT WITH: AMINES. AMMONIA. STRONG ACIDS. STRONG BASES. STRONG OXIDIZERS. AVOID CONTACT WITH METALS SUCH AS: ALUMINUM. CARBON STEEL. COPPER IRON. MILD STEEL.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: DEPEND UPON TEMPERATURE, AIR SUPPLY AND THE PRESENCE OF OTHER MATERIALS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID (POLYMERIZATION): NONE

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:

SENSITIZATION SKIN: SKIN CONTACT MAY CAUSE AN ALLERGIC SKIN REACTION IN A SMALL PROPORTION OF INDIVIDUALS. HAS CAUSED ALLERGIC SKIN REACTIONS WHEN TESTED IN GUINEA PIGS. HAS CAUSED ALLERGIC SKIN REACTIONS WHEN TESTED IN MINCE. INHALATION OF VAPORS MAY RESULT IN SKIN SENSITIZATION. IN SENSITIZED INDIVIDUALS, REEXPOSURE TO VERY SMALL AMOUNTS OF VAPOR, MIST OR LIQUID MAY CUASE A SEVERE ALLERGIC SKIN REACTION.

REPEATED DOSE TOXICITY: REPEATED SKIN CONTACT MAY RESULT IN ABSORPTION OF AMOUNTS WHICH COULD CAUSE DEATH. MAY CAUSE NAUSEA AND VOMITING.

CHRONIC TOXICITY AND CARCINOGENICITY: IN A NTP CHRONIC 2-YEAR INHALATION STUDY ON GLUTARALDEHYDE, NO CACINOGENICITY WAS SEEN IN RATS OR IN MICE. AN INCREASE IN LARGE GRANULAR LYMPHOCYTES IN FISCHER RATS DOSED WITH GLUTARALDEHYDE FOR TWO YEARS WAS RANDOM OR A SECONDARY CARCINOGENIC EFFECT DUE TO A MODIFYING INFLUENCE ON THE OCCURRENCE OF THIS COMMON NEOPLASM IN THIS RAT STRAIN.

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DEVELOPMENTAL TOXICITY: HAS BEEN TOXIC TO THE FETUS IN LAB ANIMALS AT DOSES TOXIC TO THE MOTHER. DID NOT CAUSE BIRTH DEFECTS IN LABORATORY ANIMALS.

REPRODUCTIVE TOXICITY: IN ANIMAL STUDIES, DID NOT INTERFERE WITH REPRODUCTION

GENETIC TOXICOLOGY: IN VITRO GENETIC TOXICITY STUDIES WERE NEGATIVE IN SOME CASES AND POSITIVE IN OTHER CASES. ANIMAL GENETIC TOXICITY STUDIES WERE PREDOMINATNLY NEGATIVE.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

MOVEMENT & PARTITIONING: BIOCONCENTRATION POTENTIAL IS LOW (BCF LESS THAN 100 OR LOG POW LESS THAN 3). POTENTIAL FOR MOBILITY IN SOIL IS HIGH (KOC BETWEEN 50 AND 150). GIVEN ITS VERY LOW HENRY'S CONSTANT, VOLATILIZATION FROM NATURAL BODIES OF WATER OR MOIST SOIL IS NOT EXPECTED TO BE AN IMPORTANT FATE PROCESS. HENRY'S LAW CONSTANT (H): 3.3E-08 ATM* M3/MOLE; 25 DEG C MEASURED
PARTION COEFFICIENT, N-OCTANOL/WATER (LOG POW): -0.333 MEASURED
PARTION COEFFICIENT, SOIL ORGANIC CARBON/WATER (KOC): 120-500 ESTIMATED

PERSISTENCE AND DEGRADABILITY: MATERIAL IS READILY BIODEGRADABLE. PASSES OECD TEST(S) FOR READY BIODEGRADIBILITY.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: COMPLY WITH FEDERAL, STATE, LOCAL REGULATIONS. DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. THE PREFERRED OPTIONS INCLUDE SENDING TO A LICENSED, PERMITTED: RECYCLER, RECLAIMER, INCINERATOR OR OTHER THERMAL DESTRUCTION DEVICE. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: COMPOSITION INFORMATION.

RCRA HAZARD CLASS: N/A

SECTION 13: DISPOSAL CONSIDERATIONS (con't)

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME:

HAZARD CLASS:

PACKING GROUP:

LABEL STATEMENT

WATER TRANSPORTATION

PROPER SHIPPING NAME:

HAZARD CLASS:

ID NUMBER:

PACKING GROUP:

LABEL STATEMENTS:

AIR TRANSPORTATION

PROPER SHIPPING NAME:

HAZARD CLASS:

ID NUMBER:

PACKING GROUP:

LABEL STATEMENTS:

OTHER AGENCIES: N/A

SECTION 15: REGULATORY INFORMATION

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U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): ALL COMPONENTS OF THIS PRODUCT ARE ON THE TSCA INVENTORY OR ARE EXEMPT FROM TSCA INVENTORY REQUIREMENTS

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): TO THE BEST OF OUR KNOWLEDGE, THIS PRODUCT DOES NOT CONTAIN CHEMICALS AT LEVELS WHICH REQUIRE REPORTING UNDER THIS STATUTE.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): TO THE BEST OF OUR KNOWLEDGE, THIS PRODUCT DOES NOT CONTAIN CHEMICALS AT A LEVEL WHICH REQUIRE REPORTING UNDER THIS STATUTE

311/312 HAZARD CATEGORIES:

IMMEDIATE (ACUTE) HEALTH HAZARD	YES
DELAYED (CHRONIC) HEALTH HAZARD	YES
FIRE HAZARD	NO
REACTIVE HAZARD	NO
SUDDEN RELEASE OF PRESSURE HAZARD	NO

313 REPORTABLE INGREDIENTS: N/A

STATE REGULATIONS: PENNSYLVANIA HAZARDOUS SUBSTANCES LIST AND/OR PENNSYLVANIA ENVIRONMENTAL HAZARDOUS SUBSTANCE LIST: THE FOLLOWING PRODUCT COMPONENTS ARE CITED IN THE PENNSYLVANIA ENVIRONMENTAL SUBSTANCE LIST, AND ARE PRESENTED AT LEVELS WHICH REQUIRE REPORTING.

INTERNATIONAL REGULATIONS:N/A

SECTION 16: OTHER INFORMATION

OTHER INFORMATION: FOR INDUSTRIAL USE ONLY. DO NOT SPRAY OR AEROSOLIZE THE UNDILUTED FORM OF THE PRODUCT. FULL PERSONAL PROTECTIVE EQUIPMENT (INCLUDING SKIN COVERING AND FULL-FACE SCBA RESPIRATOR) IS REQUIRED FOR DILUTIONS OR MIXTURES OF THE PRODUCT USED IN A SPRAY APPLICATION. USE THIS PRODUCT IN A MANNER CONSISTENT WITH THE LISTED USE.

PREPARATION INFORMATION:

DISCLAIMER: IN COMPLIANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD, 2.9 C.F.R 1910. 1200, WE ARE PROVIDING YOU WITH A MSDS FOR THE HAZARDOUS MATERIAL YOU ARE PURCHASING.

IT IS YOUR RESPONSIBILITY TO EDUCATE YOUR EMPLOYEES ON THE SAFE USE OF THE HAZARDOUS MATERIAL.

ELECTRON MICROSCOPY SCIENCES MAKES NO PRESENTATION AS TO THE ACCURACY OF THE INFORMATION IN THE MSDS. THE INFORMATION IS BELIEVED TO BE CORRECT; HOWEVER, YOU (THE CUSTOMER), SHOULD PERFORM YOUR OWN INVESTIGATION AND INDEPENDENT VERIFICATION. IF YOU RESELL THE PRODUCT, YOU ARE RESPONSIBLE TO FORWARD THE INFORMATION IN THE MSDS TO YOUR CUSTOMER.