



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, New Zealand, Japanese, and European Union Standards

1. PRODUCT IDENTIFICATION

TRADE/MATERIAL NAME:	DYE-N-SEAL 400 Sprayable Sealer
CHEMICAL NAMES:	Acrylic Resin/Proprietary Alkanone Mixture
PRODUCT USE:	Concrete Protective Sealer
SYNONYMS:	N/A
U.N. NUMBER:	UN 1263
U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:	Class 3
HAZCHEM CODE (AUSTRALIA):	3[Y]E
POISONS SCHEDULE NUMBER (AUSTRALIA):	Schedule 5
SUPPLIER/MANUFACTURER'S NAME (USA/Canada):	AMERICAN DECORATIVE CONCRETE SUPPLY COMPANY
ADDRESS:	120 Commercial Ave, Lowell, AR 72745
EMERGENCY PHONE:	1-800-255-3924 (CHEM-TEL) in U.S., Canada, Puerto Rico, U.S. Virgin Islands
	01-813-248-0585 (outside areas above, call collect)
	1.800.592.9320
BUSINESS PHONE:	

2. COMPOSITION and INFORMATION ON INGREDIENTS

EU LABELING/CLASSIFICATION: This product meets the definitions of Highly Flammable, Harmful, and Irritant as defined by the European Union Council Directive 67/548/EEC or subsequent Directives.

EU CLASSIFICATION: F: [Highly Flammable]; Xn [Harmful]; Xi [Irritant]

EU RISK PHRASES: R: 11; R: 20; R: 36; R: 43; R: 66; R: 67

CHEMICAL NAME	CAS #	EINECS #	AICS Inventory Listing	% w/v	EU CLASSIFICATION FOR COMPONENTS
Proprietary Alkanone			Listed	> 20	Hazard Classification: F: [Highly Flammable]; Xi [Irritant] Risk Phrases: R: 11; R: 36; R: 66; R: 67
Ethylbenzene	100-41-4	202-849-4	Listed	< 80	Hazard Classification: F: [Highly Flammable]; Xn [Harmful] Risk Phrases: R: 11; R: 20
Proprietary Acrylic Resins/Additives				< 80	Hazard Classification: Not established Risk Phrases: Not established

NOTE: ALL Canadian WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. All European Union, Australian (NOHSC:2011, 8.30-8.48) information, and Japanese Industrial Standard (JIS Z 7250: 2000) required information is included.
See Section 16 for full text of Ingredient Risk Phrases

3. HAZARD IDENTIFICATION

EU LABELING/CLASSIFICATION: This product meets the definitions of Harmful and Irritant as defined by the European Union Council Directive 67/548/EEC or subsequent Directives.

EU CLASSIFICATION: F: [Highly Flammable]; Xn [Harmful]; Xi [Irritant]

EU RISK PHRASES: R: 11; R: 20; R: 36; R: 43; R: 66; R: 67

EMERGENCY OVERVIEW:

Product Description: This product is a clear, colorless liquid with a petroleum odor. **Health Hazards:** Inhalation can be harmful and can cause headache, dizziness, drowsiness, incoordination, and confusion. Causes eye and skin irritation. **Flammability Hazards:** This product is highly flammable, it can be readily ignited under almost all ambient conditions. Vapors from this product are heavier than air and 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 (e.g., carbon oxides, aldehydes, phenols, and acids). **Reactivity Hazards:** This product is not reactive. **Environmental Hazards:** Large quantities released to the environment may have an adverse effect. **Emergency Considerations:** Emergency responders should wear appropriate protection for the situation to which they respond.

3. HAZARD IDENTIFICATION (continued)

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

INHALATION: Inhalation overexposures to vapors, mists, and sprays of this product can cause irritation and coughing. Inhalation overexposures to high vapor levels of this product, as may occur in a poorly ventilated and confined space, may cause headaches, drowsiness, incoordination, other central nervous system effects, liver damage, and kidney damage.

CONTACT WITH SKIN or EYES: Vapors of this product can irritate the eyes. Direct eye contact will cause immediate pain, irritation, redness and tearing. Skin contact is moderately irritating. Prolonged or repeated skin overexposures can cause dermatitis (dry red skin). This product may cause allergic skin reaction in sensitive individuals.

SKIN ABSORPTION: The Proprietary Alkanone and Ethylbenzene components of this product can be absorbed through intact skin. Skin absorption may cause symptoms such as those described under "Inhalation".

INGESTION: Ingestion is not a significant route of occupational overexposure and is unlikely to occur. If this product is swallowed, it may irritate the mouth, throat, esophagus and other tissues of the digestive system. Symptoms of ingestion include nausea, vomiting, and diarrhea. Ingestion may also cause symptoms such as those described under "Inhalation".



INJECTION: Accidental injection of this product, via laceration or puncture by a contaminated object may cause redness at the site of injection.

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

ACUTE: Overexposures to this product can irritate eyes and mucous membranes. Inhalation, skin absorption, and ingestion overexposure can cause symptoms such as those described under "Inhalation".

CHRONIC: Prolonged or repeated skin overexposures can cause dermatitis (dry red skin). This product may cause allergic skin reaction in sensitive individuals.

TARGET ORGANS: ACUTE: Skin, eyes, respiratory system, central nervous system. CHRONIC: Skin, respiratory system, central nervous system.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD (BLUE)		2*	
FLAMMABILITY HAZARD (RED)		3	
PHYSICAL HAZARD (YELLOW)		0	
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

4. FIRST-AID MEASURES

SKIN EXPOSURE: If adverse skin effects occur, discontinue use and flush contaminated area. Seek medical attention if adverse effect occurs after flushing.

EYE EXPOSURE: If this product contaminates the eyes, rinse eyes under gently running water. Use sufficient force to open eyelids and then "roll" eyes while flushing. Minimum flushing is for 15 minutes. The contaminated individual must seek medical attention if any adverse effect continues after rinsing.

INHALATION: If vapors 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 continues after removal to fresh air.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, DO NOT INDUCE VOMITING. Never induce vomiting or give diluents (milk or water) to someone who is **unconscious, having convulsions, or unable to swallow**. If victim is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, respiratory system, and central nervous system disorders may be aggravated by overexposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: < -15°C (< 5°F)

AUTOIGNITION TEMPERATURE: Not established.

FLAMMABLE LIMITS (in air by volume, %):

LOWER (LEL): 1%

UPPER (UEL): 7%

FIRE EXTINGUISHING MATERIALS: This product is flammable. The following extinguishing materials are recommended for fires involving this product.

WATER SPRAY: OK

CARBON DIOXIDE: OK

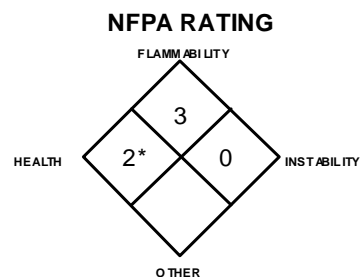
FOAM: OK

DRY CHEMICAL: OK

HALON: NO

OTHER: NO

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is a Class IIB flammable



liquid. This product may cause allergic skin reaction and so it poses a contact hazard to firefighters. When involved in a fire, this material will ignite and produce irritating vapors and toxic gases (e.g., carbon oxides, aldehydes, phenols, and acids). Vapors are heavier than air and may accumulate in low areas inadequately ventilated. Vapors from the product may travel to a source of ignition, and flashback to a leak or open container. Product or residue may ignite explosively. Product will float and can be re-ignited on the surface of the water. Closed containers may explode when exposed to extreme temperatures.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: This product may be sensitive to static discharge.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus (SCBA) 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.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Trained personnel using pre-planned procedures should respond to uncontrolled releases. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel. Eliminate all sources of ignition before cleanup begins. Use non-sparking tools. Minimum Personal Protective Equipment should be double-gloves (rubber over latex gloves) and rubber apron, splash goggles or safety glasses. Monitor area for combustible vapor levels to determine level of combustible vapors before personnel are allowed into the spill area. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Limits and Personal Protection) and at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA). Absorb spilled liquid with non-combustible absorbent materials. Decontaminate the area thoroughly. Place all spill residue in a double plastic bag and seal. Dispose of in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of the EU and its member states, Australia, New Zealand, Japan, or Canada and its Provinces.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this material ON YOU or IN YOU. Do not eat, drink, smoke, or apply cosmetics while handling this product. Wash hands thoroughly after handling this product or containers of this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Follow SPECIFIC USE INSTRUCTIONS supplied with product.

STORAGE AND HANDLING PRACTICES: Employees must be trained to properly use this product. Use in a well ventilated location. Do not allow residue from this product to dry out. 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. If this product is transferred into another container, only use portable containers and dispensing equipment (faucet, pump, drip can) approved for flammable liquids. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). 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 (i.e., sprinkler system, portable fire extinguishers). Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Empty containers may contain residual liquid or vapors that are combustible; therefore, empty packages should be handled with care. Refer to NFPA 30, *Flammable and Combustible Liquids Code*, for additional information on storage.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, and local procedures or with procedures of the EU and its member states, Australia, New Zealand, Japan, or Canada and its Provinces.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Exhaust directly to the outside, taking necessary precautions for environmental protection. If necessary, refer to Australian National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007 (1994)] for further information.

EXPOSURE LIMITS/GUIDELINES:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLV		OSHA-PEL		NIOSH-RELS		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³
Proprietary Alkanone		1188	1782	2400	2400 (vacated 1989 PEL)	590	NE	2500 (based on LEL)	DFG MAK: TWA = 1200 PEAK = 2•MAK, 15 min, average value Carcinogen: EPA-CBD, EPA-D, TLV-A4
Ethylbenzene	100-41-4	434	543	435	545 (vacated 1989 PEL)	435	545	3472	DFG MAK: Danger of cutaneous absorption Carcinogen: EPA-D, IARC-2B, MAK-3A, TLV-A3
Proprietary Resins/Additives	Acrylic	NE	NE	NE	NE	NE	NE	NE	NE

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

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: Currently, the following international exposure limits are established for components of this product. Individual country exposure limits may change and should be checked.

PROPRIETARY ALKANONE:

Australia: TWA = 500 ppm (1185 mg/m³); STEL = 1000 ppm
 Austria: TWA = 750 ppm (1780 mg/m³)
 Belgium: TWA = 750 ppm (1780 mg/m³); STEL = 1000 ppm
 Denmark: TWA = 250 ppm (600 mg/m³)
 Finland: TWA = 500 ppm (1200 mg/m³); STEL = 625 ppm (1500 mg/m³)
 France: TWA = 750 ppm (1800 mg/m³)
 Germany: TWA = 1000 ppm (2400 mg/m³)
 Hungary: TWA = 600 mg/m³; STEL = 1200 mg/m³
 India: TWA = 750 ppm (1780 mg/m³); STEL = 1000 ppm (2375 mg/m³)
 Japan: TWA = 200 ppm (470 mg/m³)
 The Netherlands: TWA = 750 ppm (1780 mg/m³)
 The Philippines: TWA = 1000 ppm (2400 mg/m³)
 Poland: TWA = 200 mg/m³
 Russia: TWA = 200 ppm; STEL = 200 mg/m³
 Sweden: TWA = 250 ppm (600 mg/m³); STEL = 500 ppm (1200 mg/m³)
 Switzerland: TWA = 750 ppm (1780 mg/m³)
 Turkey: TWA = 1000 ppm (2400 mg/m³)
 United Kingdom: TWA = 1000 ppm (2400 mg/m³); STEL = 1250 ppm
 In Bulgaria, Columbia, Jordan, Korea, New Zealand, Singapore, and Vietnam check ACGIH TLV.

ETHYLBENZENE:

Australia: TWA = 100 ppm (435 mg/m³), STEL = 125 ppm, JAN 1993
 Austria: MAK = 100 ppm (440 mg/m³), JAN 1999
 Belgium: TWA = 100 ppm (434 mg/m³), STEL = 125 ppm (543 mg/m³), JAN 1993
 Denmark: TWA = 50 ppm (217 mg/m³), JAN 1999
 and: TWA = 100 ppm (435 mg/m³), STEL = 150 ppm (655 mg/m³), JAN 1999
 France: VME = 100 ppm (435 mg/m³), JAN 1999
 Germany: MAK = 100 ppm (440 mg/m³), Skin, JAN 1999
 Hungary: TWA = 100 mg/m³, STEL = 200 mg/m³, Skin, JAN 1993
 Japan: OEL = 100 ppm (430 mg/m³), JAN 1999
 Norway: TWA = 50 ppm (220 mg/m³), JAN 1999
 The Philippines: TWA = 100 ppm (435 mg/m³), JAN 1993
 Poland: MAC (TWA) = 100 mg/m³, MAC(STEL) = 350 mg/m³, JAN 1999
 Russia: TWA = 100 ppm, STEL = 50 mg/m³, JAN 1993
 Sweden: NGV = 50 ppm (200 mg/m³), KTV = 100 ppm (450 mg/m³), JAN 1999
 Switzerland: MAK-W = 100 ppm (435 mg/m³), KZG-W = 500 ppm (2175 mg/m³), Skin, JAN 1999
 Turkey: TWA = 100 ppm (435 mg/m³), JAN 1993
 United Kingdom: TWA = 100 ppm (441 mg/m³), STEL = 125 ppm (552 mg/m³), SEP 2000
 In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-02), standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection), or standards of Australia (including AS/NZS 1715:1994 for respiratory PPE, AS/NZS 4501.2:2006 for protective clothing, AS/NZS 2161.1:2000 for glove selection, and AS/NZS 1336:1997 for eye protection). Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-02, the European Standard EN 529:2005, and EU member state standards, the Australian Standard 1716-Respiratory Protective Devices and Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices, New Zealand standards, or Japanese standards. 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 specific NIOSH recommendations for Proprietary Alkanone and Ethylbenzene in air are as follows:

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (continued)

PROPRIETARY ALKANONE

CONCENTRATION

Up to 2500 ppm:

RESPIRATORY PROTECTION

Any Chemical Cartridge Respirator with organic vapor cartridge(s), or any Powered, Air-Purifying Respirator (PAPR) with 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 Supplied-Air Respirator (SAR), or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece.

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.

ETHYL BENZENE

CONCENTRATION

Up to 800 ppm:

RESPIRATORY PROTECTION

Any Chemical Cartridge Respirator with 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 organic vapor cartridge(s), or any Supplied-Air Respirator (SAR), or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece.

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: Wear safety glasses with side shields (or goggles) and a face shield. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian CSA Standard Z94.3-02, or the European Standard CR 13464:1999, the Australian Standard 1337-Eye Protection for Industrial Applications and Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment, New Zealand standards, or Japanese standards.

HAND PROTECTION: Wear butyl rubber gloves. Check gloves for leaks. Wash hands before putting on gloves and after removing gloves. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, the Australian Standard 2161-Industrial Safety Gloves and Mittens and the European Standard CEN/TR 15419:2006, New Zealand standards, or Japanese standards.

BODY/SKIN PROTECTION: Use body protection appropriate for task (e.g., coveralls or apron). If necessary, refer to appropriate Standards of Canada, the European Standard CEN/TR 15419:2006, Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals, New Zealand standards, or Japanese 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 U.S. OSHA 29 CFR 1910.136 and the Canadian CSA Standard Z195-02, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

BOILING POINT: > 140°C (284°F)

EVAPORATION RATE ($\frac{L}{L}$ -BuAc = 1): Not established.

VAPOR PRESSURE @ 25°C: 22 mm Hg

ODOR THRESHOLD: Not established.

VAPOR DENSITY (air = 1): Not established.

COEFFICIENT WATER/OIL DISTRIBUTION: $\log P_{oct} = 0.83$

APPEARANCE, ODOR, AND COLOR: This product is a clear, colorless liquid with a petroleum odor.

HOW TO DETECT THIS SUBSTANCE (warning properties in event of accidental release): The odor may be a characteristic to distinguish a release of this product.

FREEZING/MELTING POINT: Not established.

SOLUBILITY IN WATER: Insoluble.

SPECIFIC GRAVITY (water = 1): 1.02

pH: Not applicable.

VOC: < 400 g/L (3.33 lb/gal)

10. STABILITY and REACTIVITY

STABILITY: This product is stable when properly stored at normal temperature and pressures (see Section 7, Handling and Storage).

DECOMPOSITION PRODUCTS: If exposed to extremely high temperatures, thermal decomposition may generate irritating fumes and toxic gases (e.g., carbon oxides, aldehydes, phenols, and acids).

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is incompatible with strong bases and acids.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with extreme temperatures, heat, sparks, flames, and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicological data are available for components of this product present in greater than 1% concentration and listed by CAS# in Section 2 (Composition and Information on Ingredients).

PROPRIETARY ALKANONE:

Eye Irritancy (human) = 500 ppm
TCLo (inhalation, man) = 12,000 ppm/4 hours; Central nervous system effects
TDLo (inhalation, man) = 440 $\mu\text{g}/\text{m}^3/6$ minutes
TDLo (inhalation, man) = 10 $\text{mg}/\text{m}^3/6$ hours
TCLo (inhalation, human) = 500 ppm; Eye effects
TCLo (inhalation, man) = 12,000 ppm/4 hours; Gastrointestinal tract effects
LD₅₀ (oral, rat) = 5800 mg/kg
LD₅₀ (oral, mouse) = 3000 mg/kg
LD₅₀ (oral, rabbit) = 5340 mg/kg
LD₅₀ (skin, rabbit) = 20 g/kg
LD₅₀ (skin, guinea pig) > 9400 $\mu\text{L}/\text{kg}$
LC₅₀ (inhalation, rat) = 50,100 $\text{mg}/\text{m}^3/8$ hours
LC₅₀ (inhalation, mouse) = 44 $\text{g}/\text{m}^3/4$ hours
LD₅₀ (intravenous, rat) = 5500 mg/kg
LD₅₀ (intraperitoneal, mouse) = 1297 mg/kg
LDLo (oral, dog) = 8 g/kg
LCLo (inhalation, mouse) = 110 $\text{g}/\text{m}^3/1$ hour
LDLo (intravenous, mouse) = 4 g/kg
LDLo (intraperitoneal, rat) = 500 mg/kg
LDLo (intraperitoneal, dog) = 8 g/kg; Behavioral: coma; Gastrointestinal: alteration in gastric secretions
LDLo (subcutaneous, dog) = 5 g/kg
LDLo (intravenous, rabbit) = 1576 mg/kg
LDLo (subcutaneous, guinea pig) = 5 g/kg
TDLo (oral, rat) = 273 $\text{gm}/\text{kg}/13$ weeks/continuous; Liver: changes in liver weight; Kidney, Ureter, Bladder; changes in bladder weight; Blood: normocytic anemia
TDLo (oral, mouse) = 546 $\text{gm}/\text{kg}/13$ weeks/continuous; Liver: changes in liver weight; Endocrine: changes in spleen weight
TDLo (oral, rat) = 273 $\text{gm}/\text{kg}/$ male 13 weeks pre-mating; Reproductive: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)
TCLo (inhalation, rat) = 19000 ppm/3 hours/8 weeks/ intermittent; Brain and Coverings: changes in brain weight
TCLo (inhalation, rat) = 199 $\text{mg}/\text{m}^3/8$ hours/45 days/intermittent; Behavioral: muscle contraction or spasticity

IRRITANCY OF PRODUCT: The liquid or vapors of this product are irritating to contaminated tissue.

SENSITIZATION OF PRODUCT: This product may cause allergic skin reaction in sensitive individuals.

SUSPECTED CANCER AGENT: The components of this product are listed by agencies tracking the carcinogenic potential of chemical compounds as follows:

PROPRIETARY ALKANONE: EPA-CBD (Cannot be Determined); EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)); ACGIH TLV-A4 (Not Classifiable as Human Carcinogen: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. *In vitro* or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent into one of the other categories)

ETHYL BENZENE: EPA-D (Not Classifiable as to Human Carcinogenicity); IARC-2B (Possibly Carcinogenic to Humans); MAK-3A (Substances Which Cause Concern that They Could Be Carcinogenic for Man. Substances for which the criteria for classification in Category 4 or 5 are fulfilled, but for which the database is insufficient for the establishment of a MAK value.); ACGIH-TLV-A3 (Confirmed Animal Carcinogen)

PROPRIETARY ALKANONE (continued):

TCLo (inhalation, mammal) = 31,500 $\mu\text{g}/\text{m}^3/24$ hours/1-13 days pregnant; Reproductive: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)
Skin Irritancy (rabbit) = 395 mg/open; mild
Skin Irritancy (rabbit) = 500 mg/24 hours; mild
Eye Irritancy (rabbit) = 3950 μg ; severe
Eye Irritancy (rabbit) = 20 mg/24 hours; moderate
Cytogenetic Analysis (*Saccharomyces cerevisiae*) = 200 mmol/tube
Sex Chromosome Loss and Nondisjunction (*Saccharomyces cerevisiae*) = 47,600 ppm

ETHYL BENZENE:

TCLo (inhalation, human) = 100 ppm/8 hours; Eye effects, Central nervous system effects, Pulmonary system effects
Sister Chromatid Exchange (human, lymphocyte) = 1 mmol/L
LD₅₀ (oral, rat) = 3500 mg/kg
LCLo (inhalation, rat) = 4000 ppm/4 hours
LCLo (inhalation, rat) = 740 ppm/6 hours/92 days/intermittent; Lungs, Thorax, or Respiration: changes in lung weight; Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight
LD₅₀ (intraperitoneal, mouse) = 2272 mg/kg
LD₅₀ (intraperitoneal, mouse) = 2624 $\mu\text{L}/\text{kg}$
LCLo (inhalation, mouse) = 50 $\text{g}/\text{m}^3/2$ hours
LD₅₀ (skin, rabbit) = 17,800 mg/kg
LCLo (inhalation, guinea pig) = 10,000 ppm
TCLo (inhalation, rat) = 600 $\text{mg}/\text{m}^3/24$ hours/female 7-15 days post; Teratogenic effects
TCLo (inhalation, rat) = 782 ppm/6 hours/4 weeks/intermittent; Changes in liver weight; Changes in leukocyte (WBC) count, changes in platelet count
TCLo (inhalation, rat) = 985 ppm/7 hours/female 1-19 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
TCLo (inhalation, rat) = 96 ppm/7 hours/female 1-19 days after conception; Reproductive: Specific Developmental Abnormalities: musculoskeletal system

ETHYL BENZENE (continued):

TCLo (inhalation, rat) = 97 ppm/7 hours/female 15 days pre-mating; Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)
TCLo (inhalation, rat) = 600 $\text{mg}/\text{m}^3/24$ hours/female 7-15 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants), Effects on Embryo or Fetus: fetal death, Specific Developmental Abnormalities: musculoskeletal system
TCLo (inhalation, rat) = 2400 $\text{mg}/\text{m}^3/24$ hours/female 7-15 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
TCLo (inhalation, mouse) = 975 ppm/6 hours/97 days/intermittent; Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight
TCLo (inhalation, mouse) = 782 ppm/6 hours/4 weeks/intermittent; Liver: changes in liver weight
TCLo (inhalation, rabbit) = 1 $\text{g}/\text{m}^3/24$ hours/female 7-20 days post; Reproductive effects
TCLo (inhalation, rabbit) = 100 $\text{mg}/\text{m}^3/4$ hours/30 weeks/intermittent; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol), other changes, changes in leukocyte (WBC) count
TCLo (inhalation, rabbit) = 99 ppm/7 hours/female 1-18 days after conception; Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth)
TCLo (inhalation, rabbit) = 500 $\text{mg}/\text{m}^3/24$ hours/female 7-20 days after; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
Mutation in Mammalian Somatic Cells (lymphocyte, mouse) = 80 mg/L
Micronucleus Test (embryo, hamster) = 25 mg/L
Skin Irritancy (rabbit) = 15 mg/24 hours/open; Mild
Standard Draize Test (eye, rabbit) = 500 mg; Severe
Eye Irritancy (rabbit) = 100 mg

11. TOXICOLOGICAL INFORMATION (Continued)

SUSPECTED CANCER AGENT (continued): It cannot be confirmed that the remaining components of this product are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, and CAL/OSHA.

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

MUTAGENICITY: The components of this product listed by CAS # in Section 2 are not reported to cause human mutagenic effects.

EMBRYOTOXICITY: The components of this product listed by CAS # in Section 2 are not reported to cause human embryotoxic effects.

TERATOGENICITY: The components of this product listed by CAS # in Section 2 are not reported to cause teratogenic effects in humans.

REPRODUCTIVE TOXICITY: The components of this product listed by CAS # in Section 2 are not reported to cause human reproductive effects.

*A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An **embryo toxin** is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process.*

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, there are ACGIH Biological Exposure Indices (BEIs) determined for components of this product, as follows:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
ACETONE • Acetone in urine	• End of shift	• 50 mg/L
Ethylbenzene • Sum of Mandelic Acid & Phenyl Glyoxylic Acid In Urine • Ethyl Benzene in End-Exhaled Air	• End of shift at end of workweek • Not Critical	• 0.7 g/g creatinine • —

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will be relatively stable under ambient environmental conditions. The following environmental data are available for components of this product:

PROPRIETARY ALKANONE:

Estimated Log K_{ow} = -0.24.

Estimated Log K_{oc} = 1

Water Solubility = Miscible.

Biodegradation: Although Proprietary Alkanone is quite readily degraded in the environment, the primary removal of Proprietary Alkanone is through evaporation. BOD = 122%; 5 days.

Bioconcentration: The potential for bioconcentration in fish is negligible. One experimental study of bioconcentration in adult haddock at 7-9°C (static test) resulted in a BCF of 0.69

Mobility/Soil Adsorption: Proprietary Alkanone is expected to be very mobile in soil, based on estimated Log K_{ow} and Log K_{oc} values. Proprietary Alkanone has shown no adsorption to montmorillonite, kaolinite clay or stream sediment.

Persistence: If released to soil, Proprietary Alkanone is expected to volatilize (from moist soil surfaces). Proprietary Alkanone will be highly mobile in soil, possible leaching to groundwater. Proprietary Alkanone is expected to biodegrade from soils. If released to water, Proprietary Alkanone will not adsorb to suspended solids or sediments. Proprietary Alkanone is expected to volatilize from water surfaces to the atmosphere. The estimated half-lives of Proprietary Alkanone in a model river and model lake are 38 and 33 hours, respectively. If released to the atmosphere, Proprietary Alkanone will exist solely as a vapor in the atmosphere. Vapor-phase Proprietary Alkanone is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. The half-life for this reaction in air is estimated to be 71 days. The average rate of photodissociation of Proprietary Alkanone by natural sunlight in the lower troposphere has been measured as 1×10^{-7} sec-s. This corresponds to a half-life of about 80 days.

ETHYL BENZENE:

Octanol/Water Partition Coefficient: Log K_{ow} = 3.15

Solubility: 0.014 g/100 in water.

Biodegradation: After a period of inocula adaptation, Ethyl Benzene is biodegraded fairly rapidly by sewage, or activated sludge inocula. As a component of gas oil, it is completely degraded in groundwater in 8 days, and seawater in 10 days. In a mesocosm experiment using simulated Narragansett Bay conditions, complete biodegradation occurred in approximately 2 days after a 2-week lag in spring and a 2-day lag in summer. Part of the attenuation in concentration from a leaky gasoline storage tank in the chalk aquifer in England has been attributed to biodegradation. No degradation was observed in an anaerobic reactor even after 110 days acclimation or at low concentrations in a batch reactor in 11 weeks under denitrifying conditions. Percent removal in an anaerobic, continuous-flow, laboratory biofilm column was 7% after a 2-day detention time; 99% removal was observed in a similar aerobic column following a 20-minute detention time.

Bioconcentration: Experimental data on the bioconcentration of Ethyl Benzene include a log BCF of 1.9 in goldfish and a log BCF of 0.67 for clams exposed to the water-soluble fraction of crude oil. Using its octanol/water partition coefficient (log K_{ow} = 3.15) and using a recommended regression equation, one can calculate a log BCF in fish of 2.16, indicating that Ethyl Benzene should not significantly bioconcentrate in aquatic organisms.

Terrestrial Fate: When released onto soil, part of the Ethyl Benzene will evaporate into the atmosphere. It has a moderate adsorption in soil. While there are no direct data concerning its biodegradability in soil, it is likely that it may biodegrade slowly after acclimation of ambient microorganisms. It will not hydrolyze in soil or groundwater.

12. ECOLOGICAL INFORMATION (continued)

Aquatic Fate: When released into water, Ethyl Benzene will evaporate fairly rapidly into the atmosphere with a half-life ranging from hrs to a few wks. Biodegradation will also be rapid (half-life 2 days) after a population of microorganisms capable of degrading toluene becomes established which will depend on the particular body of water and the temperature. In one study, this acclimation took 2 days and 2 weeks in summer and spring, respectively. Some Ethyl Benzene will be adsorbed by the sediment but significant bioconcentration in fish is not expected to occur based upon its octanol/water partition coefficient. There is evidence that Ethyl Benzene slowly biodegrades in groundwater. It will not significantly photolyze or hydrolyze.

Atmospheric Fate: If Ethyl Benzene is released to the atmosphere, it will exist predominantly in the vapor phase based on its vapor pressure. It will be removed from the atmosphere principally by reaction with photochemically produced hydroxyl radicals (half-life, 0.5 hr to days). Additional quantities will be removed by rain. It will not be expected to directly photolyze.

Harmful to aquatic life in very low concentrations. Fouling to shoreline.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No specific information is currently available on the effect of this product on plants or animals in the environment. This product may be harmful to contaminated plant and animal life, especially if released to the environment in large quantities.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No information is currently available on the effect of this product on aquatic plants or animals in the environment. Release of this product to an aquatic environment may be harmful to aquatic plant and animal life in contaminated bodies of water, especially in large quantities. The following aquatic toxicity data are available for components of this product:

PROPRIETARY ALKANONE:

TLm (*Daphnia magna*) 24 and 48 hours, = 10 mg/L (conditions of bioassay not specified)

TLm (brine shrimp) 24 and 48 hours = 2100 mg/L, (conditions of bioassay not specified)

NOEC (*Daphnia magna*) reproduction = 3,200 mg/L

NOEC (*Daphnia magna*) growth = 1,000 mg/L

LC₅₀ (mosquito fish) 24-96 hours = 13,000 mg/L

LC₅₀ (goldfish) 24 hours = 5,000 mg/L

LC₅₀ (*Lepomis macrochirus* bluegill sunfish) 96 hours = 8,300 mg/L

LC₅₀ (*Poecilia reticulata* guppy) 14 days = 7,032 mg/L

LC₅₀ (*Mexican axolotl*, clawed toad 3-4 weeks after hatching) 48 hours = 20,000 mg/L

LC₅₀ (*Daphnia magna*) growth = 17,100 mg/L

LC₅₀ (*Salmo gairdneri*, rainbow trout) 86 hours = 5,540 mg/L @ 12°C; (95% confidence limit 4,740-6,330 mg/L) , wt 1.0 g (static bioassay)

LC₅₀ (*Gammarus pulex*) = 5,500 mg/L

LC₅₀ (*Pimephaleus promelas*) 96 hours = 8,120 mg/L, (conditions of bioassay not specified)

LC_{50,F} (fingerling trout) 24 hours = 6,100 mg/L

LD₁₀₀ (*Asellus aquaticus*) within 3 days = 3 mL (conditions of bioassay not specified)

LD₁₀₀ (*Gammarus fossarum*) 48 hours = 10 mL/L; (conditions of bioassay not specified)

EC₀ (*Pseudomonas putida* bacteria) 16 hours = 1,700 mg/L

EC₀ (*Microcystis aeruginosa* algae) 8 days = 530 mg/L

EC₀ (*Scenedesmus quadricauda* green algae) 7 days = 7,500 mg/L

EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 28 mg/L

EC₀ (*Uronema parduczi* Chatton-Lwoff protozoa) = 1,710 mg/L

EC₅₀ (*Daphnia magna*) reproduction = 4,000 mg/L

ETHYL BENZENE:

Log BCF (*Selenastrum capricornutum*) = 2.31)

Log BCF (goldfish) = 1.19

EC₀ (*Pseudomonas putida* bacteria) 16 Hours = 12 mg/L

EC₀ (*Microcystis aeruginosa*) 8 days = 33 mg/L

EC₀ (*Scenedesmus quadricauda*) 7 days = > 160 mg/L

EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 140 mg/L

EC₀ (*Uronema parduczi* Chatton-Lwoff protozoa) = > 110 mg/L

EC₀ (young Coho salmon) 24-96 hours = 10 mg/L

EC₅₀ (*Selenastrum capricornutum*) 8 days = 4 mg/L

EC₅₀ (*Salmo gairdneri*) 4 days = 4.2 mg/L

EC₅₀ (*Selenastrum capricornutum*) 3 days = 4.6 mg/L

IC₅₀ (*Daphnia magna*) 24 hours = 2.2 mg/L

LC₅₀ (fatheads) 24-96 hours = 48 mg/L (soft water)

LC₅₀ (fatheads) 24-96 hours = 42 mg/L (hard water)

LC₅₀ (bluegills) 24-96 hours = 32-35 mg/L (soft water)

LC₅₀ (goldfish 24-96 hours = 94 mg/L (soft water)

LC₅₀ (guppies 24-96 hours = 97 mg/L (soft water)

LC₅₀ (*Poecilia reticulata*) 4 days = 9.6 mg/L

LC₁₀₀ (young Coho salmon) 24 hours = 50 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada and its Provinces, Australia, New Zealand, Japan, the EU, or EU member States. 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.

U.S. EPA WASTE NUMBER: Wastes of this product should be tested to see if they meet the criteria for waste characteristic ignitability (D001). Testing should be done, per EPA criteria to test wastes to make this determination.

14. TRANSPORTATION INFORMATION

THIS PRODUCT IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

UN IDENTIFICATION NUMBER: UN 1263
PROPER SHIPPING NAME: Paint related material
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)
PACKING GROUP: II
DOT LABEL(S) REQUIRED: Class 3 (Flammable)
EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2004: 128
MARINE POLLUTANT: No component is classified as a Marine Pollutant, per Appendix B to 49 CFR 172.101
NOTE: Shipments of this product can qualify for specific exceptions, as follows:
Shipments under 30 mL (1 ounce): Such shipments qualify for the small quantity exception (per 49 CFR 173.4). These shipments must be properly marked and packaged, per 49 CFR 173.4.
Shipments of not more than 1 L (0.3 gallons): Such shipments qualify for limited quantity exception and may qualify to be shipped as a consumer commodity. These shipments must be properly marked and packaged, per 49 CFR 173.150.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is classified as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Paint related material
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)
UN IDENTIFICATION NUMBER: UN 1263
PACKING GROUP: II
HAZARD LABEL (S) REQUIRED: Class 3 (Flammable)
SPECIAL PROVISIONS: 59
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX: 5
ERAP INDEX: None
PASSENGER CARRYING SHIP INDEX: None
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: 60
MARINE POLLUTANT: No component of this product meets the criteria for marine pollutant, per Part 2, Section 2.7 of the Consolidated Transportation of Dangerous Goods Regulations.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): This product is classified as dangerous goods under rules of IATA.

UN IDENTIFICATION NUMBER: UN 1263
PROPER SHIPPING NAME: Paint related material
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)
PACKING GROUP: II
HAZARD LABEL(S) REQUIRED: Class 3 (Flammable)
PASSENGER and CARGO AIRCRAFT PACKING INSTRUCTION: 305
PASSENGER and CARGO AIRCRAFT MAXIMUM NET QUANTITY PER PKG: 5 L
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY PACKING INSTRUCTION: Y305
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY MAXIMUM NET QUANTITY PER PKG: 1 L
CARGO AIRCRAFT ONLY PACKING INSTRUCTION: 307
CARGO AIRCRAFT ONLY MAXIMUM NET QUANTITY PER PKG: 60 L
SPECIAL PROVISIONS: A3, A72

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION: This product is classified as Dangerous Goods by the International Maritime Organization.

PROPER SHIPPING NAME: Paint related material
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)
UN IDENTIFICATION NUMBER: UN 1263
PACKING GROUP: II
LABEL(S) REQUIRED: Class 3 (Flammable)
SPECIAL PROVISIONS: 163, 944
PACKING INSTRUCTIONS: P001
EmS: F-E, S-E
STOWAGE and SEGREGATION: Category B
MARINE POLLUTANT: No component of this product meets the criteria for marine pollutant.

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

SUBSTANCE IDENTIFICATION NO.: 1263
NAME OF SUBSTANCE: Paint related material
CLASS: 3
CLASSIFICATION CODE: F1
PACKING GROUP: II
LABEL: 3
SPECIAL PROVISIONS: 163, 640D, 650
LIMITED QUANTITIES: LQ6
PAKING INSTRUCTIONS: P001, IBC02, R001

14. TRANSPORTATION INFORMATION (continued)

MIXED PAKING PROVISIONS: MP19
HAZARD IDENTIFICATION NO.: 33

AUSTRALIAN FEDERAL OFFICE OF ROAD SAFETY CODE FOR THE TRANSPORTATION OF DANGEROUS GOODS BY ROAD OR RAIL: This product is not classified as dangerous goods, per regulations of the Federal Office of Road Safety.

U.N. NUMBER: 1263
NAME OF SUBSTANCE: Paint related material
HAZARD CLASS: 3
PACKING GROUP: PG II
HAZCHEM CODE: 3[Y]E
SPECIAL PROVISIONS: SP163, SP185, SP187
PACKAGING CODE: 3.8.3

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The 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, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Proprietary Alkanone	No	Yes	No
Ethylbenzene	No	No	Yes

U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: Yes; FIRE: Yes; REACTIVE: No; SUDDEN RELEASE: No

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

U.S. CERCLA REPORTABLE QUANTITY (RQ): Proprietary Alkanone = 5000 lb (2268 kg); Ethylbenzene = 1000 lb (454 kg).

U.S. TSCA INVENTORY STATUS: Proprietary Alkanone and Ethylbenzene are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Ethylbenzene is on the California Proposition 65 Lists. **WARNING:** This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

ANSI LABELING (Z129.1): **WARNING!** FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED, ABSORBED THROUGH THE SKIN, OR SWALLOWED. CAUSES SKIN, EYE, AND RESPIRATORY TRACT IRRITATION. CAN CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. Keep away from heat, sparks, and flame. Avoid contact with skin, eyes, and clothing. Avoid breathing vapors, mists, or sprays. Do not taste or swallow. Avoid prolonged or repeated skin contact. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear appropriate eye, hand, and body protection. Avoid exposure to elevated temperatures. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, foam, dry chemical, or CO₂. **IN CASE OF SPILL:** Absorb spill with polypads and place in suitable container. Place residual in appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations or those of Canada, EU Member States or Australia. Consult Material Safety Data Sheet for additional information.

CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: Proprietary Alkanone and Ethylbenzene are on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: Proprietary Alkanone and Ethylbenzene are not on the CEPA Priorities Substances Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS:

Class B2: Flammable liquid

Class D2A: Very Toxic Material Causing Immediate and Serious Toxic Effects

Class D2B: Toxic Material Causing Other Toxic Effects



15. REGULATORY INFORMATION (continued)

EUROPEAN UNION INFORMATION:

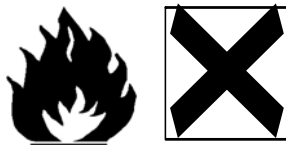
EU LABELING/CLASSIFICATION: This product meets the definitions of Highly Flammable, Harmful, and Irritant as defined by the European Union Council Directive 67/548/EEC or subsequent Directives.

EU CLASSIFICATION: F: [Highly Flammable]; Xn [Harmful]; Xi [Irritant]

EU RISK PHRASES: [R: 11] Highly flammable. [R: 20] Harmful by inhalation. [R: 36] Irritating to eyes. [R: 43] May cause sensitization by skin contact. [R: 66] Repeated exposure may cause skin dryness or cracking. [R: 67] Vapors may cause drowsiness or dizziness.

EU SAFETY PHRASES: [S: 2] Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 9] Keep container in a well-ventilated place. [S: 16] Keep away from sources of ignition-No smoking. [S: 24/25] Avoid contact with skin and eyes. [S: 26] In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 29] Do not empty into drains. [S: 46] If swallowed, seek medical advice immediately and show this container or label. [S: 60] This material and its container must be disposed of as hazardous waste.

EUROPEAN UNION ANNEX II HAZARD SYMBOL: Xn [Harmful]; Xi [Irritant]



AUSTRALIAN INFORMATION:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: Proprietary Alkanone and Ethylbenzene are listed on the AICS.

HAZARDOUS SUBSTANCES INFORMATION SYSTEM (HSIS): Proprietary Alkanone and Ethylbenzene are listed in the HSIS.

CLASSIFICATION: F: [Highly Flammable]; Xn [Harmful]; Xi [Irritant]

RISK PHRASES: [R: 11] Highly flammable. [R: 20] Harmful by inhalation. [R: 36] Irritating to eyes. [R: 43] May cause sensitization by skin contact. [R: 66] Repeated exposure may cause skin dryness or cracking. [R: 67] Vapors may cause drowsiness or dizziness.

SAFETY PHRASES: [S: 2] Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) [S: 9] Keep container in a well-ventilated place. [S: 16] Keep away from sources of ignition-No smoking. [S: 24/25] Avoid contact with skin and eyes. [S: 26] In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 29] Do not empty into drains. [S: 46] If swallowed, seek medical advice immediately and show this container or label. [S: 60] This material and its container must be disposed of as hazardous waste.

POISONS SCHEDULE NUMBER: Schedule 5

ADDITIONAL LABELING: For advice, contact a Poisons Information Centre (61-2-9845-3111) or a doctor (at once). If swallowed, do NOT induce vomiting.

NEW ZEALAND INFORMATION:

HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT (1996): Proprietary Alkanone and Ethylbenzene are registered as hazardous substances with the Environmental Risk Management Authority. Specific controls apply to these compounds and may apply to this product.

JAPANESE INFORMATION:

JAPANESE ENCS: Proprietary Alkanone and Ethylbenzene are on the ENCS Inventory.

JAPANESE MINISTRY OF ECONOMY, TRADE, AND INDUSTRY (MITI) STATUS: Proprietary Alkanone and Ethylbenzene are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese METI.

POISONOUS AND DELETERIOUS SUBSTANCES CONTROL LAW: Proprietary Alkanone and Ethylbenzene are not listed as a Specified Poisonous Substance under the Poisonous and Deleterious Substances Control Law.

16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
800/441-3365

DATE OF PRINTING:

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DEFINITION OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these, which are commonly used, include the following:

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

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

DFG MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens 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 or animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances 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.

NIOSH RELS: NIOSH's Recommended Exposure Limits.

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.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD (continued):

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 LD₅₀ Rat or Rabbit.* ≤ 20 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat.* ≤ 0.05 mg/L).

FLAMMABILITY HAZARD:

0 (Minimal Hazard-Materials that will not burn in air when exposure to a temperature of 815.5°C [1500°F] for a period of 5 minutes.); **1** (Slight Hazard-Materials that must be pre-heated before ignition can occur. Material 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

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 LD₅₀ Rat 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 LD₅₀ Rat 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 LD₅₀ Rat 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 LD₅₀ Rat or Rabbit.* > 20-200 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat.* > 0.05-0.5 mg/L.);

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. **2 (continued)** *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. **Reactivities:** 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 \geq 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. **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.); **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 LC_{50} for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 2000 mg/kg. Materials

HEALTH HAZARD (continued): 3 (continued) 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 LC_{50} for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD_{50} for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD_{50} for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 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 up 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). 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 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials

that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures: Materials that 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. 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 **LDo**, or **TC**, **TCo**, **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.

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:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **ACGIH**: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **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/NDSL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA or Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration.

EUROPEAN: **EU** is the European Union (formerly known as the **EEC**, European Economic Community). **EINECS**: This the European Inventory of Now-Existing Chemical Substances. The **ARD** is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the **RID** are the International Regulations Concerning the Carriage of Dangerous Goods by Rail. **AUSTRALIAN**: **AICS** is the Australian Inventory of Chemical Substances. **NOHSC**: National Occupational Health & Safety Code.