



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I

What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): DYNALENE MV[®]

CHEMICAL NAME/CLASS: Heat Transfer Fluid
SYNONYMS: Mixture: None applicable.

DISTRIBUTOR'S NAME: Dynalene Heat Transfer Fluids
ADDRESS: 5250 West Coplay Road
Whitehall, PA 18052

EMERGENCY PHONE: 1 -800-424-9300 (CHEMTREC)
BUSINESS PHONE: +1-610-262-9686

DATE OF PREPARATION: August 29, 2004
DATE OF REVISION: January 7, 2008

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% v/v	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Aromatic Hydrocarbon	Proprietary		NE	NE	NE	NE	NE	NE
Diluent	Proprietary		NE	NE	NE	NE	NE	NE
Non-Hazardous Ingredients, per 29 CFR 1910.1200. These ingredients are each less than one percent in concentration and do not contribute significantly to the hazards associated with this product.		< 1%	NE	NE	NE	NE	NE	NE

NE = Not Established

C = Ceiling Level (See Section 16 for Definitions of Terms Used.)

NOTE (1): All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

NOTE (2): All hazard information pertinent to the proprietary compounds has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, colorless, combustible liquid, with a strong aromatic hydrocarbon odor. The product will ignite and burn at elevated temperatures in the presence of an ignition source. Vapors and mists from this product may be irritating, if inhaled. In the event of an emergency involving this product, it must be treated as a combustible liquid. Emergency responders must wear proper personal protective equipment, and have adequate fire protection for the situation to which they are responding.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: This product is slightly to moderately toxic by ingestion and mildly toxic by inhalation and skin contact. The strong aromatic and citric odor may be objectionable, but is not considered toxic. Symptoms of over-exposure may include dizziness, drowsiness, gastric upset, and nausea.

INHALATION: Mild respiratory irritation may occur after inhalation of the mists or vapors of this product, with coughing and possible breathing difficulty. Most complaints of over-exposure are derived from the strong odor, rather than from systemic or local toxicity. High dose over-exposure may cause central nervous system depression symptoms, such as drowsiness, dizziness, nausea, vomiting, excitability, narcosis, and at very high concentration, unconsciousness or death.

CONTACT WITH SKIN or EYES: This liquid may cause local redness or irritation of the skin following prolonged exposure. Contact with the eyes will cause irritation and burning, which will be resolved when the product is rinsed from the eyes.

SKIN ABSORPTION: The aromatic hydrocarbon compound is reported to enter the body via absorption through the skin. Symptoms such as those listed above for "Inhalation Over-exposure", as well as gastric upset and nausea may occur.




INGESTION: Ingestion of this product, while not likely in an industrial setting, may cause irritation of the mouth and throat, gastric upset and nausea. Vomiting may occur. Aspiration may cause chemical pneumonia and lung damage.

INJECTION: Accidental injection of this product may cause local irritation and redness.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. This product is generally low risk for possible health hazards.

ACUTE: Very high over-exposure by inhalation of vapors or mists may cause respiratory irritation, drowsiness, and dizziness. Ingestion may cause an upset stomach and vomiting. Contact with the skin may be mildly irritating. If the liquid, vapors, or mist contacts the eyes, irritation may occur.

CHRONIC: Prolonged over-exposure may cause liver or kidney damage. This product is not known to cause any specific chronic illnesses.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	2
REACTIVITY		yellow	0
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		
For routine industrial applications			

PART II

What should I do if a hazardous situation occurs?

4. FIRST-AID MEASURES

SKIN EXPOSURE: If the product is spilled the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. The minimum recommended flushing time is 15 minutes; use soap if available. Victims must seek immediate medical attention, especially if irritation or redness develops.

4. FIRST-AID MEASURES (continued)

EYE EXPOSURE: Immediately flush victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. If irritation develops, seek medical attention.

INHALATION: If vapors or mists of the product are inhaled, remove victim to fresh air. If not breathing, begin artificial respiration.

INGESTION: If the product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or health professional with victim.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): 53°C (127°F) (Tag Closed Cup); >61°C (>142°F)(Tag Open Cup)

AUTOIGNITION TEMPERATURE, °C: 388°C (730°F) (ASTM E659)

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): 0.9
Upper (UEL): 6.5

FIRE EXTINGUISHING MATERIALS:

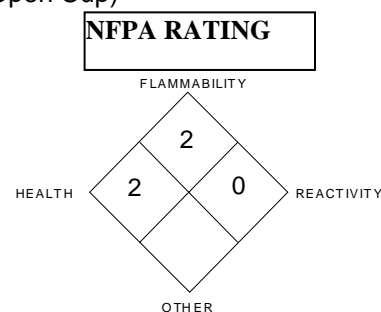
Water Spray: YES (cooling only) Carbon Dioxide: YES Foam: YES
Dry Chemical: YES Halon: YES Other: Any "B" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This is a combustible liquid. When involved in a fire, this material may decompose and produce irritating fumes and toxic gases including oxides of carbon and heavy, black soot and smoke.

Explosion Sensitivity to Mechanical Impact: Not sensitive

Explosion Sensitivity to Static Discharge: This product may be ignited by static discharge, especially if heated.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear self-contained Breathing Apparatus and full protective equipment.



6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: In case of a spill, clear the affected area, protect people, and respond with trained personnel.

Clean-up small spills (5 gallons or less) promptly. Wear safety glasses, Viton™, Silver Shield™, or Nitrile Rubber gloves, apron or other equivalent body protection, and full work shoes. Use an air-purifying respirator, consistent with the recommendations in Section 8 (Exposure Controls-Personal Protection).

For large spills (greater than 5 gallons), the minimum Personal Protective Equipment should be: **Chemical resistant gloves (Nitrile Rubber over Viton™, or other suitable resistant gloves), chemically resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus.** Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Place all spill residue in a double plastic bag and seal. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13, Disposal Considerations).

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used.

PROTECT THE ENVIRONMENT: This product may float on water. Measures should be taken to limit runoff onto soil, waterways, or sewer.

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling this product. Do not eat or drink while handling this product.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing vapors or mists generated by this product. Use only with adequate local ventilation to ensure vapor concentrations are below the applicable guidelines listed in Section 2 (Composition and Information on Ingredients) and that flammable concentrations of vapors do not accumulate. Open containers slowly, on a stable surface. Wash thoroughly after using this material.

Inspect containers to ensure proper labeling and good condition before storage or use. Store containers in a cool; dry location, away from direct sunlight, or sources of intense heat. Keep containers away from incompatible chemicals. Keep container tightly closed when not in use. Vapors from this product are heavier than air and may travel long distances to an ignition source and flashback. Empty containers may contain ignitable vapors, and may explode, if subject to a cutting torch. Containers in storage and in use must be properly grounded and bonded. Check grounding and bonding periodically for continuity.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate local ventilation. Use a mechanical fan or vent area to outside. Provide sufficient ventilation to prevent employee discomfort from the strong aromatic odor of this product.

RESPIRATORY PROTECTION: None needed for normal circumstances of use. Maintain airborne contaminant concentrations below exposure limits listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed, use only protection authorized in 29 CFR 1910.134, or applicable State regulations. Use supplied air respiration protection if oxygen levels are below 19.5% or are unknown.

EYE PROTECTION: Splash goggles or safety glasses.

HAND PROTECTION: Wear Viton™, Silver Shield™, or Nitrile Rubber gloves for routine industrial use. Use Nitrile Rubber over Viton™ or other suitable resistant gloves for spill responses as stated in Section 6 (Accidental Release Measures) of this MSDS.

BODY PROTECTION: Use body protection appropriate for task.

PERSONAL PROTECTIVE EQUIPMENT LEVEL: C

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): 4.5

SPECIFIC GRAVITY (water = 1): 0.85

SOLUBILITY IN WATER: Negligible.

VAPOR PRESSURE, mm Hg @ 25 °C: 1.9

ODOR THRESHOLD: Not determined

COEFFICIENT WATER/OIL DISTRIBUTION: Not available.

APPEARANCE AND COLOR: Clear, colorless, liquid. Appearance and color may be altered, if a dye is added to satisfy vendor or customer requirements.

HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance and the strong hydrocarbon odor are characteristic of this product.

EVAPORATION RATE (n-BuAc=1): < 1

MELTING POINT or RANGE: < -118°C (< -180°F)

BOILING POINT: 176 - 179°C (348-354°F)

pH: Not applicable.

10. STABILITY and REACTIVITY

STABILITY: Stable

DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide. Containers should be handled appropriately because of the possibility of explosion or fire. For additional information, call the Dynalene Engineering Department at +1-610-262-9686.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with strong oxidizers, exposure to excessive heat, or to sparks, flame, or other ignition sources.

PART IV

Is there any other useful information about this material?

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Additional toxicology information for components greater than 1 percent in concentration is provided below.

Aromatic Hydrocarbon:

Skin Irritancy (rabbit) 100% Moderate reaction.

Eye Irritancy (rabbit) 88 mg. Mild reaction.

LD₅₀ (oral-rabbit) = 3 gm/kg

LD₅₀ (oral-mammal) = 6200 mg/kg

LC₅₀ (rat) = 2520-5000 mg/kg

Diluent:

TDL₀ (oral-rat) 20083 mg/kg. Reproductive effects.

TDL₀ (oral-rat) 20083 mg/kg. Teratogenic effects.

TDL₀ (oral-mouse) 67000 mg/kg. Experimental teratogenic effects.

LD₅₀ (oral-rat) = 4400 mg/kg

LD₅₀ (intraperitoneal-rat) = 3600 mg/kg

LC₅₀ (intravenous-rat) = 110 mg/kg

LD₅₀ (oral-mouse) = 5600 mg/kg

LD₅₀ (intraperitoneal-mouse) = 600 mg/kg

LD₅₀ (intraduodanal-mouse) = 1000 mg/kg

SUSPECTED CANCER AGENT: This product's ingredients are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore is not considered to be, nor suspected to be cancer causing agents by these agencies.

IRRITANCY OF PRODUCT: This product is a mild skin and eye irritant.

SENSITIZATION TO THE PRODUCT: This product is not known to cause sensitization.

BIOLOGICAL EXPOSURE INDICES: Not applicable.

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

Mutagenicity: The components of this product are not known to cause mutagenic effects.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans, see the following paragraph for additional information.

Teratogenicity: The diluent component of this product has been shown to cause teratogenic effects in laboratory animals at very high doses.

Reproductive Toxicity: The diluent component of this product has been shown to cause reproductive toxicity in laboratory animals at very high doses.

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

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, kidney, liver, and respiratory disorders may be aggravated by over-exposure to this product.

ECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce exposures. No Biological Indices currently exist for the components of this product.

12. ECOLOGICAL INFORMATION

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ENVIRONMENTAL STABILITY: If the aromatic hydrocarbon compound or diluents are released into the soil, they will be volatilized near the surface or will leach to the groundwater. The aromatic hydrocarbon compound or diluent will be biodegraded in aerobic environments. The half-life of the components of this product in water is estimated to be relatively short. This product is not expected to adsorb to neither sediment nor bioconcentrate in aquatic organisms.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: While no specific data exist related to the effect of this product on plants or animals, it is expected to cause effects similar to those described for humans. Vegetation may be severely stressed, due to the oily nature of this product.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product will float on water and will cut-off oxygenation of bodies of water, contributing to aquatic toxicity.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This chemical, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION WHEN SHIPPED BY AIR, VESSEL, OR IN BULK HIGHWAY or RAIL CONTAINERS (> 110 gallons).

PROPER SHIPPING NAME: Dynalene MV™ (Diethylbenzene solution)
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable Liquid)
UN IDENTIFICATION NUMBER: UN 2049
PACKING GROUP: III
DOT LABEL (S) REQUIRED: Flammable Liquid

NOTE: The bulk packaging requirements of 49 CFR 173.241 are applicable.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 130

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS.

15. REGULATORY INFORMATION

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.

COMPOUND	SECTION 302	SECTION 304	SECTION 313
Aromatic Hydrocarbon	NO	NO	NO
Diluent	NO	NO	NO

SARA Threshold Planning Quantity: Not applicable.

TSCA INVENTORY STATUS: The chemicals in this product are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not Applicable.

15. REGULATORY INFORMATION (continued)

OTHER FEDERAL REGULATIONS: No special regulations are applicable.

STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: NO
California - Permissible Exposure Limits for Chemical Contaminants: NO
Florida - Substance List: NO
Illinois - Toxic Substance List: NO
Kansas - Section 302/313 List: NO

Massachusetts - Substance List: NO
Minnesota - List of Hazardous Substances: NO
Missouri - Employer Information/Toxic Substance List: NO
New Jersey - Right to Know Hazardous Substance List: NO
North Dakota - List of Hazardous Chemicals, Reportable Quantities: NO

Pennsylvania - Hazardous Substance List: NO
Rhode Island - Hazardous Substance List: NO
Texas - Hazardous Substance List: NO
West Virginia - Hazardous Substance List: NO
Wisconsin - Toxic and Hazardous Substances: NO

CALIFORNIA PROPOSITION 65: No component of this solution is on the California Proposition 65 lists.

LABELING (Precautionary Statements): **WARNING!** Combustible liquid. Vapors are heavier than air and may travel a long distance to an ignition source and flashback, causing a fire or explosion. Harmful by irritation if in contact with skin, or eyes. Harmful if swallowed. Irritating to eyes, skin, and respiratory system. Keep away from heat, sparks, and sources of ignition, including flames. Do not smoke when working with this product. Empty containers may contain ignitable or explosive concentrations of vapors. Do not cut containers with a torch or other spark-producing tool. Avoid breathing vapors or mists. Use with sufficient mechanical ventilation to prevent excessive exposure. In case of contact with skin or eyes, rinse affected area thoroughly. Remove contaminated clothing and do not re-use. Seek medical attention. Clean-up spills promptly. Keep containers closed when not in use. Store containers in a cool, dry location. Containers should be properly grounded when in storage and when in use. Grounding and bonding should be checked for continuity. Wear protective equipment appropriate for the task. Refer to MSDS for additional information. Keep out of the reach of children.

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

WHMIS SYMBOLS:



16. OTHER INFORMATION

PREPARED BY: DYNALENE HEAT TRANSFER FLUIDS
5250 West Coplay Road
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Date of Printing: January 7, 2008.

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

DEFINITIONS OF TERMS

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

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance, which 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 **Time Weighted Average (TWA)**, the 15-minute **Short Term Exposure Limit**, and the instantaneous **Ceiling Level**. Skin adsorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - 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 which was vacated by Court Order.

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. **The**

DFG - MAK is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **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**). NIOSH issue exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

FLAMMABILITY LIMITS IN AIR

Much of the information related to fire and explosion is derived from the **National Fire Protection Association (NFPA)**. **L_{EL}** - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **U_{EL}** - the highest percent of vapor in air, by volume, that

will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION

Possible health hazards as derived from human data, animal's 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. Data from several sources are used to evaluate the cancer-causing potential of the material. 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 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 death. **BEI** - 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.

REGULATORY INFORMATION

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and Transport Canada, respectively. The following laws are pertinent to the information presented in the MSDS: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substance Control Act (TSCA)**; Marine Pollutant status according to the **DOT**; California's Safe Drinking Water Act (**Proposition 65**); the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**. This section also includes information on the precautionary warnings, which appear, on the material's package label.