DYNALENE
Tomorrow's Solutions **Flow** Through Us

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 LC**

CHEMICAL NAME/CLASS: Heat Transfer Fluids
SYNONYMS: Inhibited Glycol

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: February 17, 2012

DATE OF REVISION: February 17, 2012

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% v/v	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV	STEL	PEL	STEL	IDLH	OTHER
			mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
Proprietary	Proprietary		NE	NE	NE	NE	NE	NE
Proprietary		Balance	None of the ingredients in the Inhibitor Solution contribute any significant, additional hazard to these products. All pertinent hazard information has been provided in this Material Safety Data Sheet, per the requirements of the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

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

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

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, red, odorless, syrupy liquid. Vapors and mists from this product may be irritating if inhaled. The solution can be irritating to contaminated skin or eyes. This product must be substantially preheated before ignition can occur. If involved in a fire, this liquid will release toxic gases (i.e. carbon monoxide and carbon dioxide). This product is not reactive. 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: The most significant routes of exposure to this product are by inhalation of the vapors and contact with the skin and eyes.

INHALATION: Inhalation of the mists or vapors of this product may be irritating to the nose, throat, mucous membranes, and other tissues of the respiratory system. Propylene Glycol is the main component of this product. Vapor concentrations of Propylene Glycol are normally too low at room temperature (due to the low vapor pressure) to cause significant toxic effects from vapor alone.

CONTACT WITH SKIN or EYES: This product may cause local redness or irritation of the skin. Repeated or prolonged exposure may lead to dermatitis. Contact with the eyes will cause redness, irritation, tearing, and possibly burning.

SKIN ABSORPTION: Based on clinical tests, skin absorption is a potential route of over-exposure for Propylene Glycol (the main component of this product). Symptoms of such exposure can include symptoms described for "Contact with Skin and Eyes".

INGESTION: Ingestion of this product, while not likely to occur in an industrial setting, may cause irritation of the mouth and throat, gastric upset, nausea and vomiting.

INJECTION: Though not an expected route of occupational exposure for this product, injection (via punctures or lacerations in the skin) may cause local reddening, tissue swelling and discomfort.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	0
FLAMMABILITY	(RED)	0
REACTIVITY	yellow	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		

For routine industrial applications

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Symptoms associated with over-exposure to this product are as follows:

ACUTE: Inhalation of the mists or vapors of this product may be irritating to the nose, throat, mucous membranes, and other tissues of the respiratory system. This product may also be irritating to contaminated skin or eyes.

CHRONIC: Prolonged or repeated skin exposures may cause irritation, which could lead to dermatitis (dry, chapped skin).
TARGET ORGANS: Skin, eyes.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

SKIN EXPOSURE: If this product contaminates 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. Contaminated individual must seek immediate medical attention, especially if irritation or redness develops.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Contaminated individual must seek

immediate medical attention, especially if symptoms persist.

4. FIRST-AID MEASURES (Continued)

INHALATION: If vapors or mists of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: Hazards from swallowing this product is not expected to be serious. If symptoms develop, seek medical attention.

5. FIRE-FIGHTING MEASURES

NFPA RATING:

HEALTH: 0 **FLAMABILITY: 0** **REACTIVITY: 0** **SPECIAL HAZARD: 0**

Degree of Hazard: 0=Not Hazard 4= Severe Hazard

FLASH POINT, °C (method): Not Applicable.

AUTOIGNITION TEMPERATURE, °C: Not Applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not Applicable
Upper (UEL): Not Applicable

FIRE EXTINGUISHING MATERIALS:

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

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product must be substantially pre-heated before ignition can occur. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., carbon oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed containers if it can be done without risk to firefighters. If possible, prevent run-off water from entering storm drains, bodies of water, or other environmentally areas. Decontaminate fire-response equipment with soap and water solution if necessary.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of an uncontrolled release, clear the affected area, protect people, and respond with trained personnel.

SMALL SPILL: Cover with absorbent material (floor absorbent, vermiculite, etc.) Soak up spill and place material into a drum.

LARGE SPILL: Personnel involved with large releases should wear protective equipment. Stop spill at source, dike the area surrounding the spill to prevent further exposure. Prevent material from entering sewer system. If pump is available, pump spilled material into 55-gallon drums for proper disposal. If necessary, absorbents such as vermiculite, clay floor absorbent may be used on spill and shoveled into drums.

Personal Protective Equipment should be **Level D: chemical resistant gloves (rubber gloves and Nitrile gloves), and coveralls, safety glasses, safety shield. If heated, this product may displace oxygen in an enclosed area.**

Monitoring of oxygen level is recommended. Decontaminate the area thoroughly. If necessary, decontaminate spill response equipment with soap and water solution. Dispose of in accordance with Federal, State and local hazardous waste disposal regulations (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling these materials. Use in a well-ventilated location. Use ventilation and other engineering controls to minimize potential exposure to the aerosol, sprays and vapors of this product. Removed contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Use in a well-ventilated location. Open drums and other containers of this product slowly, on a stable surface. Drums and other containers of this product should be properly labeled. Empty drums and containers may contain residual amounts of this product, therefore, empty containers should be handled with care. Move drums of this product carefully, with the appropriate drum-handling equipment.

Store drums and other containers in a cool, dry location, away from direct sunlight, or sources of intense heat. Storage areas should be made of fire-resistant materials. Keep containers away from incompatible chemicals (See Section 10, Stability and Reactivity).

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. General methods include mechanical (local exhaust) ventilation, process or personnel enclosure and control of process conditions. Local exhaust ventilation may be necessary when this material is heated or a mist created. Supply sufficient replacement air to make up for air removed by exhaust system. Prudent practice is to ensure eyewash/safety shower stations are available near areas where This product is used.

RESPIRATORY PROTECTION: None needed for normal circumstances of use. 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 butyl rubber, natural rubber, neoprene, Nitrile rubber, or other suitable gloves for routine industrial use.

BODY PROTECTION: Use body protection appropriate for task.

PERSONAL PROTECTIVE EQUIPMENT LEVEL: D

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): 2.62
FREEZING/MELTING POINT or RANGE: -51°C (-60°F) (Product)
EVAPORATION RATE (n-BuAc=1): Not available.
SPECIFIC GRAVITY (water = 1): 1.038
SOLUBILITY IN WATER: Soluble.
VAPOR PRESSURE, mm Hg @ 20 °C: 0.07
ODOR THRESHOLD: Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Log P (oct) = -1.41, -0.30
BOILING POINT: >100 °C (>212°F)

pH: Approximately 5.5-6.5

APPEARANCE AND COLOR: This product is a clear, colorless, odorless, syrupy liquid with a faint, chemical odor. Alternate colors are available, pending customer preferences.
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance is a distinguishing characteristic of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Mainly carbon dioxide and carbon monoxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers, strong acids, acid chlorides, acid anhydrides, chloroformates, or strong reducing agents.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Additional toxicology information for components greater listed in Section 2 (Composition and Information on Ingredients) in concentration is provided below.

Propylene Glycol:
Skin-Human: 500 mg/7 Days; Mild irritation effects
Skin-Human: 104 mg/3 days - Intermittent, Moderate irritation effects
Skin-Man 10%/2 days
Eye effects-Rabbit, adult : 100 mg, Mild irritation effects
Eye effects-Rabbit, adult: 500 mg/24 hours, Mild irritation effects
DNA Inhibition-Mouse-Subcutaneous: 8000 mg/kg
Cytogenetic Analysis-Mouse-Subcutaneous: 8000 mg/kg
Cytogenetic Analysis-Hamster: fibroblast: 32 g/L
Intraperitoneal-Mouse TDLo: 100 mg/kg (15 days preg): Teratogenic effects
Intraperitoneal-Mouse TDLo: 100 mg/kg (11 days preg): Reproductive effects
Oral-Child TDLo: 79 g/kg/56 weeks, Intermittent: Central nervous system and brain effects

Propylene Glycol (Continued):
Parenteral-Infant TDLo: 10 g/kg/3 days - Continuous: systemic effects
Oral-Rat LD50: 20 g/kg
Intraperitoneal-Rat LD_{50}: 6660 mg/kg
Subcutaneous-Rat LD_{50}: 22,500 mg/kg
Intravenous-Rat LD_{50}: 6423 mg/kg
Intramuscular-Rat LD_{50}: 14 g/kg
Oral-Mouse LD_{50}: 22 g/kg
Intraperitoneal-Mouse LD_{50}: 9718 mg/kg;
Subcutaneous-Mouse LD_{50}: 17,370 mg/kg;
Intravenous-Mouse LD_{50}: 6630 mg/kg

SUSPECTED CANCER AGENT: The ingredients of this product are not listed on the following lists: FEDERAL OSHA Z LIST, NTP, IARC or CAL/OSHA, and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.
IRRITANCY OF PRODUCT: This product may cause irritation to contaminated tissues.

SENSITIZATION TO THE PRODUCT: The components of this product are not known to cause sensitization after prolonged or repeated exposures.
REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and their components on the human reproductive system.

Mutagenicity: The components of this product are not reported to cause mutagenic effects in humans.
Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.
Teratogenicity: This product is not reported to cause teratogenic effects in humans.
Reproductive Toxicity: This product is not reported to cause reproductive effects in humans.

A mutagen is a chemical, which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical, which 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, which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance, which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: It is anticipated that mainly skin and eye disorders may be aggravated after over-exposure.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure.

BIOLOGICAL EXPOSURE INDICES: Currently, there are no Biological Indices (BEIs) associated with the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will be degraded over time into other inorganic and organic compounds. The following information is available for the components of this product:

Propylene Glycol: Soluble in water. Stable under ordinary conditions. Should be subject to biodegradation.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to contaminated plant and animal life especially if large quantities are released.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to aquatic life if large quantities are released into bodies of water.

13. DISPOSAL CONSIDERATIONS

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

EPA WASTE NUMBER: Not applicable to wastes consisting only to wastes of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Not applicable.
HAZARD CLASS NUMBER and DESCRIPTION:	Not applicable.
UN IDENTIFICATION NUMBER:	Not applicable.
PACKING GROUP:	Not applicable.
DOT LABEL (S) REQUIRED:	Not applicable.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): Not applicable.

MARINE POLLUTANT: No component of this product is classified as a Marine Pollutant, as per Appendix B to 49 CFR

172.101.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS NOT 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
Propylene Glycol	NO	NO	NO

SARA THRESHOLD PLANNING QUANTITY: Not applicable.

15. REGULATORY INFORMATION (continued)

TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER FEDERAL REGULATIONS: Not 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
Michigan - Critical Materials Register: 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 Propylene Glycol
Rhode Island – Hazardous Substance List: Propylene Glycol
Texas – Hazardous Substance List: NO
W. Virginia–Hazardous Substance List: NO
Wisconsin – Toxic and Hazardous Substance: NO.

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

LABELING (Precautionary Statements): **CAUTION!** MAY CAUSE SKIN AND EYE IRRITATION. Avoid contact with eyes, skin, and clothing. Wear appropriate eye and skin protection. Avoid breathing air or mist. Use or store with adequate ventilation. Keep workplace airborne concentrations below legal and recommended limits. Circumstances could require use of respiratory protection. Refer to applicable OSHA Regulations. Wash thoroughly after handling. Do not transfer to unmarked container. Keep container closed when not in use. Open container slowly. Do not empty with pressure. Empty containers may contain hazardous product residues. Do not use welding or cutting torch on or near this container, even when empty. IN CASE OF SPILL: Absorb with inert material and place in suitable container. Flush area with soapy water. Refer to MSDS for additional information.

WHMIS SYMBOLS: Not applicable.

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16. OTHER INFORMATION

PREPARED BY:

DYNALENE HEAT TRANSFER FLUIDS
5250 West Coplay Road
Whitehall, PA 18052
+1-610-262-9686

Date of Printing: February 17, 2012.

DEFINITIONS OF TERMS

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

CAS #: This is the Chemical Abstract Service Number who 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. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issue exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). 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 **N**ational **F**ire **P**rotection **A**ssociation (**NFPA**). 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

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds is presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - 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/m^3** 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**, **LCLO**, 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.