

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 HF- LO[®]**
CHEMICAL NAME/CLASS: Heat Transfer Fluid
SYNONYMS: Mixture: None applicable.
DISTRIBUTOR'S NAME: **Dynalene Heat Transfer Fluids**

DATE OF PREPARATION: May 14, 2004

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% v/v	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV	STEL	PEL	STEL	IDLH	
			mg/m ³	mg/m ³	mg/m ³	mg/m ³	mg/m ³	
Aliphatic Hydrocarbon Blend	Proprietary	<100%	NE	NE	NE	NE	NE	NE
Additives		Balance	None of the other ingredients has established exposure limits or contributes any significant, additional hazard to this product. 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. This product is hazardous as defined in 29 CFR 1910.1200.

OSHA HAZARD: Combustible

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, colorless, to slightly yellow, combustible liquid. Vapors and mists from this product may be irritating, if inhaled. The product can be irritating to contaminated skin or eyes. The product will ignite and burn at elevated temperatures in the presence of an ignition source. If involved in a fire, this liquid will release toxic gases. This product is not reactive under typical emergency response conditions. 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 mists or vapors generated by the product and contact with the skin and eyes.

INHALATION: High vapor / aerosol concentrations (attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death effects, including death.

CONTACT WITH SKIN or EYES: Slightly irritating but does not injured eye tissue. Low order of toxicity. Frequent or prolonged contact may irritate and cause dermatitis. Skin contact may aggravated an existing dermatitis condition.

INGESTION: Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing death. Minimal toxicity.

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

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	2
REACTIVITY			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: Flush with large amounts of water: use soap if available. Remove grossly contaminated clothing, including shoes, and launder before reuse.

EYE EXPOSURE: Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

INHALATION: Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is topped. Keep at rest. Call for prompt medical attention.

INGESTION: If the product is swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): > 61°C (>141°F) (Closed Cup)

AUTOIGNITION TEMPERATURE, °C: > 337°C (> 640°F)

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): 0.6
Upper (UEL): 4.5

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: Combustible liquid can form combustible mixtures at temperatures at or above the flash point.

Static Discharge, material can accumulate static charges, which can cause an incendiary electrical discharge. "Empty" containers retain product residue (liquid/or vapor) and can be dangerous. DO NOT pressurize, cut weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum re-conditioner, or properly disposed of.

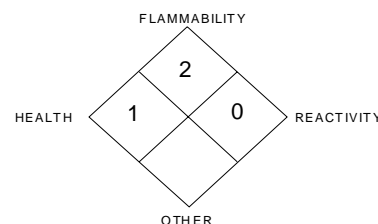
SPECIAL FIRE-FIGHTING PROCEDURES: Use water spray to cool fire exposed surfaces and to protect personnel. Isolate "fuel" supply from fire. Use foam, dry chemical, or water spray to extinguish fire.

Avoid spraying water directly into storage containers due to danger of boil over.

This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS: No unusual.

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Eliminate sources of ignition. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel. Prevent liquid from entering sewers, watercourses, or low areas. Contained spilled liquid with sand or earth. Do not use combustible materials such as sawdust. Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.

In event of a non-incident released, use non-sparking tools and have adequate fire protection. The minimum Personal Protective Equipment should be: Chemical resistant gloves, (such as Nitrile, polyvinyl alcohol or Viton™), rubber apron or other chemically resistant suit, and boots, hard-hat, and if vapors are high, use an NIOSH approved organic vapor respirator. Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. If necessary, decontaminate spill response equipment with soap and water solution. Place all spill residues in a suitable container and seal. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13, Disposal Considerations).

WATER SPILL: Eliminate sources of ignition. Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.

Remove from surface by skimming or with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters. Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

PART III

How can I prevent hazardous situations from occurring?

7. HANDLING and STORAGE

STORAGE AND HANDLING PRACTICES: Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. DO NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight. Material will accumulate static charges, which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures. Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Do NOT reuse empty containers without commercial cleaning or reconditioning.

ELECTROSTATIC ACCUMULATION HAZARD: Yes, see proper bonding and/or grounding procedure.

STORAGE TEMPERATURE, °F: Ambient

STORAGE /TRANSPORT PRESSURE, mmHg: Atmospheric

LOADING /UNLOADING TEMPERATURE, °F: Ambient

LOADING/UNLOADING VISCOSITY, cSt: 2.0

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE CONTROLS: The use of local exhaust ventilation is recommended to control process emission near the source. Laboratory samples should be handled in a lab hood. Provide mechanical ventilation of confined spaces. See respiratory protection recommendations.

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: Wear safety glasses with side shields.

HAND PROTECTION: Wear long sleeves and chemical resistant gloves.

BODY PROTECTION: Use body protection appropriate for task.

PERSONAL PROTECTIVE EQUIPMENT LEVEL: C

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not Available.

EVAPORATION RATE (n-BuAc=1): 0.1

SPECIFIC GRAVITY (water = 1): < 1

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

SOLUBILITY IN WATER: < 1% Practically insoluble.

BOILING POINT: >191°C (>376°F)

VAPOR PRESSURE, mm Hg @ 25 °C: < 2

pH: Not applicable.

ODOR THRESHOLD: Not Available.

COEFFICIENT WATER/OIL DISTRIBUTION: Not available.

10. STABILITY and REACTIVITY

STABILITY: Stable

DECOMPOSITION PRODUCTS: Ignition of this product can produce carbon dioxide, carbon monoxide and other organic decomposition products.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizing agents.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION: Not Applicable.

PART IV

Is there any other useful information about this material?

11. TOXICOLOGICAL INFORMATION

Please refer to Section 3 for available information on potential health effects.

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 organic compounds.

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. 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 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.

14. TRANSPORTATION INFORMATION

DOT SHIPPING DESCRIPTION

PROPER SHIPPING NAME: Petroleum Distillate, N.O.S.

HAZARD CLASS NUMBER and DESCRIPTION: Combustible Liquid

UN IDENTIFICATION NUMBER: UN 1268

PACKING GROUP: III

DOT LABEL (S) REQUIRED: NONE

NOTE: In containers of 119 gallons capacity or less this product is not regulated by DOT.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: Under provisions of Title III, Section 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Fire.

COMPOUND	SECTION 302	SECTION 304	SECTION 313
Aliphatic Hydrocarbon	NO	NO	NO

SARA Threshold Planning Quantity: Not applicable.

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

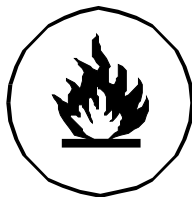
CERCLA REPORTABLE QUANTITY (RQ): Not Applicable.

OTHER FEDERAL REGULATIONS: Not Applicable.

CLEAN WATER ACT/ OIL POLLUTION ACT: This product is classified as an oil under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Act 1990. Discharge or spills which produce a visible sheen on either surface water, or in waterways/ sewers which lead to surface water, must be reported to the National Response Center.

LABELING (Precautionary Statements): **CAUTION!** COMBUSTIBLE LIQUID AND VAPORS.

WHMIS SYMBOLS: **B3:** Flammable and combustible materials/ Combustible liquid.



16. OTHER INFORMATION

PREPARED BY: DYNALENE HEAT TRANSFER FLUIDS

Date of Printing: June 30, 2004.

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)**. **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'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.

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