Material Safety Data Sheet
DowFrost™ HD 50%
Heat Transfer Fluid

Section 1. Product and Company Identification

Product Name: DowFrost™ HD Heat Transfer Fluid
Product Code: C-F-DOW-HID50-06X01G, C-F-DOW-HID50-02X02G, C-F-DOW-HID50-01X05G
Effective Date: October 3, 2008

Manufacturer Information: Douglas Products and Packaging Company
1550 East Old 210 Highway
Liberty, Missouri 64068
Information Phone: (816) 781-4250
Emergency Phone: Chemtrec (800) 424-9300

Section 2. Ingredients and Hazards Identification

Hazardous Components		Occupational Exposure Limits			
Component	CAS Number	OSHA PEL	ACGIH TLV	Weight Percent	Section 313
Propylene Glycol	57-55-6	10 mg/m^3	ND	≥50.00	No
Water	7732-18-5			<50.0	No
Dipotassium hydrogen phosphate	7758-11-4			<5.0	No
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.					

Section 3. Hazard Identification

Potential Health Effects:
Eyes: May cause slight temporary eye irritation. Corneal injury is unlikely.
Skin: Prolonged contact is essentially nonirritating to skin. Repeated contact may cause flaking and softening of the skin.
Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Mist may cause irritation of upper respiratory tract (nose and throat).
Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.
Effects of Repeated Exposure: In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

Section 4. First Aid Measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. IF effects occur, consult a physician, preferably an ophthalmologist.
Skin Contact: Wash skin with plenty of water.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Ingestion: No emergency medical treatment necessary.
Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Section 5. Fire Fighting Measures

Flash Point: 219 °F Flammability Limits: LEL 2.6 UEL 12.5

Extinguishing Media: Water for or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affecte4d zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazard: Container may rupture from gas generation in a fire situation.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Section 6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or ground water. See Section 12, Ecological Information.

Section 7. Handling and Storage

General Handling: No special precautions required. Keep container closed. Spills of these organic materials on hot fibrous insulations may lead to lowering of the Autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, Exposure Control and Personal Protection.

Storage: Do not store in: Galvanized Steel. Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. Store in original unopened container. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

Section 8. Exposure Control/Personal Protection

Component	List	Type	Value
Propylene Glycol	**WEEL**	**TWA Aerosol**	**10 mg/m3**

Personal Protection

Eye/Face Protection: Use safety glasses

Skin Protection: Wear clean, body-covering clothing.

Hand Protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferre4d glove barrier materials include: Butyl rubber. Natural rubber (latex). Neoprene. Nitrile/butadiene rubber (nitrile or NBR). Polyethylene. Ethyl vinyl alcohol laminate (EVAL). Polyvinyl alcohol (PVA). Polyvinyl chloride (PVC or vinyl). NOTICE: The selection of a specific glove for a particular application and duration of sue in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity,

thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particular pre-filter.
Ingestion: Use good personal hygiene. Do not consume or store food in work area. Wash hands before smoking or eating.

Engineering Controls
Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Section 9. Physical and Chemical Properties			
Odor	Characteristic	**Vapor Pressure**	2.2 mmHg
Color	Yellow	**% Volatiles by Volume**	ND
Physical State	Liquid	**Specific Gravity (H_2O=1)**	1.06 @ 20°C
pH	9.5 (@50%)	**Solubility**	100%
Freezing Point	Supercools	**Boiling Point**	152 °C / 700 °F
Vapor Density(air=1)	>1.0	**Flash Point-Closed Cup**	104 °C / 219 °F

Section 10. Stability and Reactivity

Stability/Instability
Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.
Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Avoid direct sunlight or ultraviolet sources.
Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.
Hazardous Polymerization: None
Thermal Decomposition: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldephydes. Alcohols. Ethers. Organic acids.

Section 11. Toxicological Information

Acute Toxicity
Ingestion
LD50, Rat, female 20,300 mg/kg
Skin Absorption
For similar material(s): LD50, Rabbit >10,000 mg/kg
Repeated Dose Toxicity
In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.
Chronic Toxicity and Carcinogenicity
Similar formulations did not cause cancer in laboratory animals.
Developmental Toxicity
For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.
Reproductive Toxicity
For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.
Genetic Toxicity
In vitro genetic toxicity studies were negative. For the major component(s): Animal genetic toxicity studies were negative.

Section 12. Ecological Information

Ecotoxicity: For the major component(s): Material is practically non-toxic to aquatic organisms on an acute basis (LOC50/E50>100 mg/L in the most sensitive species tested.
Movement and Partitioning
For the major component(s): Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
Persistence and Degradability
For the major component(s): Material is readily biodegradable. Passes OECD test(s) for rady biodegradability.

Section 13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOUGLAS PRODUCTS AND PACKAGING HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR USED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. As a service to its customers, Douglas Products and Packaging can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums.

Section 14. Transport Information

D.O.T. Classification: Not regulated by US DOT
IMDG: Not regulated
ICAO/IATA: Not regulated
Shipping Name: DowFrost™ HD Heat Transfer Fluid
Technical Shipping Name: None
UNFIC: None
ID Number: None
Packaging Group: None
Labels: No US DOT Labels

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

Section 15. Regulatory Information

EPCRA 311/312 Categories:	Immediate (Acute) Health Effects:	No
	Delayed (Chronic) Health Effects:	No
	Fire Hazard:	No
	Sudden Release of Pressure	No
	Reactivity:	No

Right to know classification: Propylene glycol is listed in CA, PA, MN, MA, MI, FL and NJ.

TSCA: Propylene glycol. All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.
Reportable Quantity (RQ): None
CEPA: This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL).
Propylene glycol is listed in chemical inventories in: AICS, ECL, EEC, ENCS, EU, Israel, MAC, MAK, MITI, PICCS, SWISS, Taiwan, USA and UK

Abbreviations:

AICS	Australian Inventory of Chemical Substances
CAS #	Chemical Abstract Service Number
°C	Celsius temperature scale
°F	Fahrenheit temperature scale
ECL	Korean Existing Chemicals List
EEC	European Economic Commission
ENCS	Japanese Existing and New Chemical List
EINECS #	European Inventory of Existing Chemical Substances Number
EU	European Union
(Israel)	2001 proposed list of chemical substances to be regulated under Israel Hazardous Substances Law and Regulations List
MAC	Netherlands
MAK	Germany
MITI	Ministry of International trade and Industry
NA	Not applicable
PEL	Permissible Exposure Limit
PICCS	Philippines Inventory of Chemicals and Chemical Substances
PPE	Personal Protective Equipment
Prop.	Proprietary
NA	Not applicable
ND	Not determined
STEL	Short Term Exposure Limit
SWISS	Giftliste 1
SWISS	Inventory of Notified New Substances
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
(Taiwan)	List of Toxic Chemical Substances regulated under Taiwan Toxic Chemical Substances Control Act of 1086
USA	United States of America
UK	United Kingdom

Section 16. Other Information

Hazard Rating System

Health	0
Fire	1
Reactivity	0

Health 4 Deadly 3 Extreme Danger 2 Dangerous 1 Slight hazard 0 No hazard
Fire 4 < 73 °C 3 < 100 °C 2 < 200 °C 1 >200 °C 0 Will not burn
Reactivity/Instability 4 – May detonate 3 Explosive 2 Unstable 1 Normally stable 0 Stable

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