Safety Data Sheet

TRIAFROST PG (BIO-BASED)

SECTION 1. MATERIAL AND COMPANY IDENTIFICATION

PRODUCT NAME:	TRIAFROST PG (BIO-BASED)
VERSION:	OCTOBER 2015
MANUFACTURER:	PACIFIC FUNCTIONAL FLUIDS, LLC 2244 PORT OF TACOMA ROAD TACOMA, WA 98421-3607
CUSTOMER SERVICE:	253-284-4302 / 888-586-7295
24 HOUR EMERGENCY CONTACT:	**CHEMTREC: 1- 800-424-9300**

SECTION 2. HAZARDS IDENTIFICATION

WARNING

THIS PRODUCT IS NOT A "HAZARDOUS CHEMICAL" AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.

POTENTIAL HEALTH EFFECTS:

EYE: MAY CAUSE EYE IRRITATION.

SKIN: BRIEF CONTACT IS NON-IRRITATING. PROLONGED OR REPEATED EXPOSURE IS LIKELY TO CAUSE SKIN IRRITATION. ADVERSE EFFECTS ARE NOT EXPECTED FROM BRIEF CONTACT.
SKIN ABSORPTION: UNLIKELY TO RESULT IN ABSORPTION OF HARMFUL AMOUNTS.

INGESTION: SINGLE DOSE ORAL TOXICITY IS CONSIDERED TO BE LOW. SMALL AMOUNTS SWALLOWED INCIDENTAL TO NORMAL HANDLING OPERATIONS ARE NOT LIKELY TO CAUSE INJURY; SWALLOWING AMOUNTS LARGER THAN THAT MAY CAUSE INJURY. IF ASPIRATED (LIQUID ENTERING THE LUNG), BASED ON PHYSICAL PROPERTIES, NOT LIKELY TO BE AN ASPIRATION HAZARD.

INHALATION: A SINGLE BRIEF (MINUTES) INHALATION EXPOSURE IS NOT LIKELY TO CAUSE ADVERSE EFFECTS. VAPORS OR MIST MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT (NOSE AND THROAT).

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REPEATED EXPOSURE: IN RARE CASES, REPEATED EXCESSIVE EXPOSURE TO PROPYLENE GLYCOL (BIO-BASED) (BIO-BASED) MAY CAUSE CENTRAL NERVOUS EFFECTS.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT NAME	CAS #	CONCENTRATION
PROPYLENE GLYCOL (BIO-BASED)	57-55-6	>95.0%
DIPOTASIUM PHOSPHATE	7758-11--4	< 5.0%
WATER	7732-18-5	< 5.0%

SECTION 4. FIRST AID MEASURES

EYE: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR SEVERAL MINUTES. REMOVE CONTACT LENSES AFTER INITIAL 1-2 MINUTES OF FLUSHING, THEN CONTINUE TO FLUSH FOR SEVERAL MINUTES. CONSULT MEDICAL PERSONNEL IF IRRITATION PERSISTS.

SKIN: WASH WITH SOAP AND WATER FOR SEVERAL MINUTES. CONSULT MEDICAL PERSONNEL IF IRRITATION PERSISTS.

INGESTION: NO ADVERSE EFFECTS ARE EXPECTED, BUT CONSULT MEDICAL PERSONNEL TO DETERMINE IF EVACUATION OF STOMACH OR INDUCTION OF VOMITING IS NECESSARY. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

INHALATION: IF IRRITATION, NAUSEA, DROWSINESS OR HEADACHES OCCUR, REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL. CALL A PHYSICIAN OR TRANSPORT TO A MEDICAL FACILITY IF CONDITIONS PERSIST.

SECTION 5. FIREFIGHTING MEASURES

EXTINGUISHING MEDIA: TO EXTINGUISH COMBUSTIBLE RESIDUES OF THIS PRODUCT USE WATER FOG, CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

FIREFIGHTING INSTRUCTIONS: EVACUATE AREA AND KEEP PEOPLE AWAY. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS AND FIRE AFFECTED ZONE UNTIL FIRE IS OUT AND DANGER OF REIGNITING HAS PASSED. TO EXTINGUISH COMBUSTIBLE RESIDUES OF THIS PRODUCT USE WATER FOG, CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

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.

HAZARDOUS COMBUSTION PRODUCTS: COMBUSTION MAY YIELD SMOKE WHICH MAY CONTAIN UNIDENTIFIED TOXIC AND/OR IRRITATING COMPOUNDS, CARBON MONOXIDE AND CARBON DIOXIDE. PRODUCT WILL NOT BURN UNTIL THE WATER HAS EVAPORATED. RESIDUE CAN BURN.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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: STOP SPILL/RELEASE IF IT CAN BE DONE SAFELY. PREVENT SPILLED MATERIAL FROM ENTERING SOIL, SEWERS, STORM DRAINS, OTHER UNAUTHORIZED DRAINAGE SYSTEMS AND NATURAL WATERWAYS. USE WATER SPARINGLY TO MINIMIZE ENVIRONMENTAL CONTAMINATION AND REDUCE DISPOSAL REQUIREMENTS. **SEE SECTION 12, ECOLOGICAL INFORMATION.**

METHODS FOR CONTAINMENT AND CLEAN UP: FOR LARGE SPILLS/RELEASES, NOTIFY RELEVANT AUTHORITIES IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. IMMEDIATE CLEAN UP OF ANY SPILL IS RECOMMENDED. DIKE FAR AHEAD OF SPILL FOR LATER RECOVERY OR DISPOSAL. ABSORB SPILL WITH INERT MATERIAL SUCH AS SAND, VERMICULITE OR KITTY LITTER AND PLACE IN SUITABLE CONTAINER FOR DISPOSAL.

SEE SECTION 13 DISPOSAL CONSIDERATIONS FOR ADDITIONAL INFORMATION.

SECTION 7. HANDLING AND STORAGE

SAFE HANDLING: KEEP AWAY FROM FLAMES AND HOT SURFACES. WASH THOROUGHLY AFTER HANDLING. USE GOOD PERSONAL HYGIENE PRACTICES AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.

SPILLS WILL PRODUCE EXTREMELY SLIPPERY SURFACES. DISPOSE OF CONTAMINATED CLOTHING OR SHOES.

STORAGE: DO NOT STORE IN GALVANIZED STEEL, OPENED OR UNLABELED CONTAINERS. STORE IN CARBON STEEL, STAINLESS STEEL OR ORIGINAL CONTAINERS. KEEP CONTAINER(S) TIGHTLY CLOSED AND PROPERLY LABELED. USE AND STORE THIS MATERIAL IN COOL, DRY, WELL-VENTILATED AREA AWAY FROM HEAT AND ALL SOURCES OF IGNITION. STORE ONLY IN APPROVED CONTAINERS. KEEP AWAY FROM ANY INCOMPATIBLE MATERIAL. PROTECT CONTAINER(S) AGAINST PHYSICAL DAMAGE.

"EMPTY" CONTAINERS RETAIN RESIDUE AND MAY BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION. ALL EMPTY CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS:

COMPONENT	LIST	TYPE	VALUE
PROPYLENE GLYCOL (BIO-BASED)	WEEL	TWA Aerosol	10mg/m3

ENGINEERING CONTROLS: GENERAL VENTILATION SHOULD BE SUFFICIENT FOR MOST OPERATIONS. IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS, ADDITIONAL ENGINEERING CONTROLS MAY BE REQUIRED TO MAINTAIN AIRBORNE LEVELS BELOW EXPOSURE LIMIT REQUIREMENTS OR GUIDELINES.

PERSONAL PROTECTIVE EQUIPMENT:

EYE/FACE PROTECTION: USE SAFETY GLASSES WITH SIDE SHIELDS. USE OF FACE SHIELD IS RECOMMENDED.

SKIN PROTECTION: WEAR CLEAN BODY-COVERING CLOTHING.

HAND PROTECTION: USE CHEMICALLY RESISTANT GLOVES. PREFERRED GLOVE MATERIALS EXAMPLES ARE: BUTYL RUBBER, LATEX, NEOPRENE, NITRILE, POLYETHYLENE AND PVC. WORKPLACE FACTORS, SUCH AS OTHER CHEMICALS HANDLED, SHOULD ALSO BE TAKEN INTO CONSIDERATION WHEN DETERMINING HAND PROTECTION.

RESPIRATORY PROTECTION: WHERE THERE IS POTENTIAL FOR AIRBORNE EXPOSURE ABOVE THE EXPOSURE LIMIT, A NIOSH CERTIFIED AIR PURIFYING RESPIRATOR EQUIPPED WITH ORGANIC VAPOR CARTRIDGE AND PARTICULATE PRE-FILTER MAY BE USED.

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OR EXCEEDS OSHA STANDARDS SHOULD BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. AIR PURIFYING RESPIRATORS PROVIDE LIMITED PROTECTION AND CANNOT BE USED IN ATMOSPHERES THAT EXCEED THE MAXIMUM USE CONCENTRATION (AS DIRECTED BY REGULATION OR THE MANUFACTURER'S INSTRUCTIONS), IN OXYGEN DEFICIENT SITUATIONS OR UNDER CONDITIONS THAT ARE IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).

INGESTION: USE GOOD PERSONAL HYGIENE. DO NOT CONSUME OR STORE FOOD IN THE WORK AREA. WASH HANDS BEFORE SMOKING OR EATING.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	**CLEAR LIQUID**
ODOR:	**MILD/CHARACTERISTIC**
ODOR THRESHOLD:	**NO TEST DATA AVAILABLE**
PH:	**10.0**
FREEZING POINT:	**super cools**
VAPOR PRESSURE:	**2.2 mmHg @ 20° C**
VAPOR DENSITY (air = 1) :	**>1.0**
BOILING POINT (760 mmHg):	**152° C (306° F)**
FLASH POINT (Closed Cup):	**104° C (219° F) Pensky-Martens closed cup**
FLAMMABLE LIMITS IN AIR	**LOWER: 2.6% (V) PROPYLENE GLYCOL (BIO-BASED)** **UPPER: 12.5% (V) PROPYLENE GLYCOL (BIO-BASED)**
SOLUBILITY IN WATER (by weight):	**100%**
SPECIFIC GRAVITY (H2O = 1):	**1.05 @ 20° C**
AUTO IGNITION TEMPERATURE:	**371° C (700° F)**
DECOMPOSITION TEMPERATURE:	**NO TEST DATA AVAILABLE**
KINEMATIC VISCOSITY:	**43.4 CST @ 20° C**

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: STABLE UNDER NORMAL AMBIENT AND ANTICIPATED CONDITIONS OF USE.

REACTIVITY: NO DANGEROUS REACTION KNOWN UNDER CONDITIONS OF NORMAL USE.

CONDITIONS TO AVOID: EXTENDED EXPOSURE TO HIGH TEMPERATURES CAN CAUSE DECOMPOSITION. AVOID ALL POSSIBLE SOURCES OF IGNITION. GENERATION OF GAS DURING DECOMPOSITION CAN CAUSE PRESSURE IN CLOSED SYSTEMS.

MATERIALS TO AVOID: AVOID CONTACT WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG BASES.

HAZARDOUS DECOMPOSITION PRODUCTS: NOT ANTICIPATED UNDER NORMAL CONDITIONS OF USE.

HAZARD POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. TOXICOLOGICAL INFORMATION

INGESTION: PROPYLENE GLYCOL (BIO-BASED); LD50, RAT > 20,000 mg/kg

DERMAL: PROPYLENE GLYCOL (BIO-BASED); LD50, RABBIT >20,000 mg/kg

INHALATION: PROPYLENE GLYCOL (BIO-BASED); NO DEATHS OCCURRED FOLLOWING EXPOSURE TO A SATURATED ATMOSPHERE. LC50, 8 H, VAPOR, RAT 4.1 MG/L

EYE/DAMAGE OR IRRITATION: MAY CAUSE SLIGHT TEMPORARY EYE IRRITATION. CORNEAL INJURY UNLIKELY.

SKIN IRRITATION/CORROSION: PROLONGED CONTACT IS ESSENTIALLY NON-IRRITATING TO SKIN. REPEATED CONTACT MAY CAUSE FLAKING AND SOFTENING OF SKIN.

SENSITIZATION
SKIN: **PROPYLENE GLYCOL (BIO-BASED)**; DID NOT CAUSE ALLERGIC SKIN REACTIONS WHEN TESTED IN HUMANS.

RESPIRATORY: NO RELEVANT INFORMATION FOUND.

REPEATED DOSE TOXICITY: IN RARE CASES, REPEATED EXCESSIVE EXPOSURE TO PROPYLENE GLYCOL (BIO-BASED) MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS.

CHRONIC TOXICITY AND CARCINOGENICITY: SIMILAR FORMULATIONS DID NOT CAUSE CANCER IN LABORATORY ANIMALS.

DEVELOPMENTAL TOXICITY: PROPYLENE GLYCOL (BIO-BASED); DID NOT CAUSE BIRTH DEFECTS OR ANY OTHER FETAL EFFECTS IN LABORATORY ANIMALS.

REPRODUCTIVE TOXICITY: PROPYLENE GLYCOL (BIO-BASED); IN ANIMAL STUDIES, DID NOT INTERFERE WITH REPRODUCTION. IN ANIMAL STUDIES, DID NOT INTERFERE WITH FERTILITY.

GENETIC TOXICOLOGY: IN VITRO GENETIC TOXICITY STUDIES WERE NEGATIVE. PROPYLENE GLYCOL (BIO-BASED); ANIMAL GENETIC TOXICITY STUDIES WERE NEGATIVE.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY: **PROPYLENE GLYCOL (BIO-BASED)**; MATERIAL IS PRACTICALLY NON-TOXIC TO AQUATIC ORGANISMS ON AN ACUTE BASIS. (LC50/EC50/EL50/LL50>100mg/L IN THE MOST SENSITIVE SPECIES TESTED)

PERSISTENCE AND DEGRADABILITY: PROPYLENE GLYCOL (BIO-BASED); MATERIAL IS READILY BIO-DEGRADABLE. PASSES OECD TEST(S) FOR READY BIO-DEGRADABILITY.

BIO ACCUMULATIVE POTENTIAL: PROPYLENE GLYCOL (BIO-BASED); BIO CONCENTRATION POTENTIAL IS LOW (BCF < 100 OR LOG POW < 3)

MOBILITY IN SOIL: PROPYLENE GLYCOL (BIO-BASED); POTENTIAL FOR MOBILITY IN SOIL IS VERY HIGH (Koc BETWEEN 0 AND 50).

SECTION 13. DISPOSAL CONSIDERATIONS

THE GENERATOR OF A WASTE IS ALWAYS RESPONSIBLE FOR MAKING PROPER HAZARDOUS WASTE DETERMINATIONS AND NEEDS TO CONSIDER STATE AND LOCAL REQUIREMENTS IN ADDITION TO FEDERAL REGULATIONS.

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER.

RECYCLE OR DISPOSE OF IN ACCORDANCE WITH PREVAILING REGULATIONS, BY A RECOGNIZED COLLECTOR OR CONTRACTOR. THE COMPETENCE OF THE CONTRACTOR TO DEAL SATISFACTORILY WITH THIS TYPE OF PRODUCT SHOULD BE ESTABLISHED BEFOREHAND.

RECYCLE OR DISPOSE OF THE CONTAINER IN ACCORDANCE WITH THE LEGISLATION IN FORCE WITH A RECOGNIZED COLLECTOR OR CONTRACTOR.

SECTION 14. TRANSPORT INFORMATION

DOT NON-BULK:	NOT REGULATED
DOT BULK:	NOT REGULATED
IMDG:	NOT REGULATED
ICAO/IATA:	NOT REGULATED

SECTION 15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD
THIS PRODUCT IS NOT A "HAZARDOUS CHEMICAL" AS DEFINED BY OSHA HAZARD COMMUNICATION STANDARD.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT / TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW) SECTIONS 311 AND 312

IMMEDIATE (ACUTE) HEALTH HAZARD:	NO
DELAYED (CHRONIC) HEALTH HAZARD:	NO
FIRE HAZARD:	NO
REACTIVE HAZARD:	NO
SUDDEN RELEASE OF PRESSURE:	NO

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT / TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO NOW ACT): TO THE BEST OF OUR KNOWLEDGE, THIS PRODUCT DOES NOT CONTAIN CHEMICALS AT LEVELS WHICH REQUIRE REPORTING UNDER THIS STATUE.

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA HAZARDOUS SUBSTANCES LIST AND/OR PENNSYLVANIA ENVIRONMENTAL HAZARDOUS SUBSTANCE LIST: THE FOLLOWING PRODUCT COMPONENTS ARE CITED IN THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST AND/OR THE PENNSYLVANIA ENVIRONMENTAL SUBSTANCE LIST AND ARE PRESENT AT LEVELS WHICH REQUIRE REPORTING.

COMPONENT	CAS#	AMOUNT
PROPYLENE GLYCOL (BIO-BASED)	57-55-6	> 95.0%

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA SPECIAL HAZARDOUS SUBSTANCE LIST: TO THE BEST OF OUR KNOWLEDGE, THIS PRODUCT DOES NOT CONTAIN CHEMICALS AT LEVELS WHICH REQUIRE REPORTING UNDER THIS STATUE.

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT): THIS PRODUCT CONTAINS NO LISTED SUBSTANCE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM, AT LEVELS WHICH WOULD REQUIRE A WARNING UNDER THE STATUTE.

TOXIC SUBSTANCES CONTROL ACT (TSCA): ALL COMPONENTS OF THIS PRODUCT ARE ON THE TSCA INVENTORY OR ARE EXEMPT FROM TSCA INVENTORY REQUIREMENTS UNDER 40 CFR 720.30.

CEPA – DOMESTIC SUBSTANCES LIST (DSL): ALL SUBSTANCES CONTAINED IN THIS PRODUCT ARE LISTED ON THE CANADIAN DOMESTIC SUBSTANCES LIST (DSL) OR ARE NOT REQUIRED TO BE LISTED.

SECTION 16. OTHER INFORMATION

HAZARD RATING SYSTEM

NFPA	HEALTH	FIRE	REACTIVITY
	0	1	0

RECOMMENDED USES AND RESTRICTIONS:

INTENDED AS A HEAT TRANSFER FLUID FOR CLOSED-LOOP SYSTEMS. WE RECOMMEND THAT YOU USE THIS PRODUCT IN A MANNER CONSISTENT WITH THE LISTED USE.

TYPICAL PROPERTIES, NOT TO BE CONSTRUED AS SPECIFICATIONS. AS USE CONDITIONS ARE NOT WITHIN ITS CONTROL, PACIFIC FLUIDS DOES NOT GUARANTEE RESULTS FROM USE OF THE INFORMATION OR PRODUCTS HEREIN; AND GIVES NO WARRANTY, EXPRESS OR IMPLIED.

THE INFORMATION PROVIDED IN THIS SAFETY DATA SHEET IS CORRECT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF AT THE DATE OF ITS PUBLICATION. THE INFORMATION GIVEN IS DESIGNED ONLY AS GUIDANCE FOR SAFE HANDLING, USE, PROCESSING, STORAGE, TRANSPORTATION, DISPOSAL AND RELEASE AND IS NOT CONSIDERED A WARRANTY OR QUALITY SPECIFICATION. THE INFORMATION RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS, UNLESS SPECIFIED IN THE TEXT.

REGULATORY REQUIREMENTS ARE SUBJECT TO CHANGE AND MAY DIFFER FROM ONE LOCATION TO ANOTHER. IT IS THE BUYER'S RESPONSIBILITY TO INSURE THAT IT COMPLIES WITH FEDERAL, STATE/PROVINCIAL AND LOCAL LAWS.