PULSAlube TECHNICAL DATA

INTRODUCTION

PULSAlube is a specially formulated oil providing both lubricating and hydraulic properties for use in all PULSA Series pumps. This unique blend provides optimum pump performance as outlined below:

- **PULSAlube** has been formulated and qualified to function as both a hydraulic oil and lubricant for the pump mechanism including the worm gear drive.
- **PULSAlube** is blended to a specific viscosity which is appropriate for the orifice sizing in our pump hydraulic systems.
- Additives are utilized to reduce foaming and minimize air entrainment.
- **PULSAlube** assures compatibility with the materials used in our pumps.

Two grades of PULSAlube are available:

Grade	Service Range[1]
PULSAlube #1	+ 40°F to 280°F
PULSAlube #5	- 40°F to 400°F

In emergency situations when PULSAlube is not available, alternate oils may be used for temporary service. However, any alternate oil must be changed to PULSAlube at the earliest opportunity to insure proper pump performance.

NOTE:

1. For temperature ranges on other components of the pump, which may be limiting, please see Section: Application Engineering, Pages: 130, 131, 170.

PHYSICAL PROPERTIES

	PULSAlube #1 (Service range 40°F to 280°F)	PULSAlube #5 (Service range -40°F to 400°F)
150	100	32
API Gravity	28-30	34
Viscosity SSU @ 100°F	450-700	150
Viscosity SSU @ 210°F	73-78	46
Viscosity Index	95-160	135
Pour Point	15° to -25°F	-65°F

GEARBOX CAPACITY

Model	Capacity
R1	3 Quart
200C	1 Quart
340,680,680H,680CIP	1 Quart
880,880H,880CIP	2 Quart
7120,7120H,7120CIP	4 Quart
7440,7440H	5 Quart
7660,7660H	6 Gallon
8480,8480H	8 Gallon

Note: Remote head arrangements will require extra oil.

SHIPPING WEIGHT

Size	Net Weight	Gross Weight
1 qt.	1 3/4 lb.	2 lb.
1 gal.	7 1/2 lb.	8 lb.
5 gal.	39 lb.	42 lb.
55 gal.	412 lb.	453 lb.

PULSAlube OIL CHANGE

OIL CHANGE INTERVAL

The recommended oil change interval is dependent upon the operating environment, two classifications are used.

1. Normal Service: Dry atmosphere and a gearbox operating temperature of 40°F to 100°F (4.4°C to 37.7°F).

2. Severe Service: Humid atmosphere and a gearbox operating below 40°F or over 100°F.

The first oil change should be done after 6 months of continuous operation (approximately 4500 hours) and then every 12 months (9000 hours) for normal service and every 6 months (4500 hours) for severe service. Follow the procedure below when changing the oil.

OIL CHANGE PROCEDURE

1. Remove all pressure from the reagent head.
2. Disconnect power to the motor.
3. Remove the motor coupling guard.
4. Set the pump stroke to 0%.
5. Remove both covers from the Pump (Refer to Installation/Operation/Maintenance Manual MAINTENANCE, Section XI).
6. On the side of the pump at the bottom of each reservoir is a pipe plug, remove these to drain the oil. Note, on some models an oil return tube may be piped to the drain hold, remove the tube and fitting to drain the reservoir. It is not necessary to drain the oil in the hydraulic system including any piping to remote heads.
7. Wash down the inside of the gearbox with kerosene or a petroleum base solvent. It may be helpful to rotate the motor coupling by hand in order to reach all areas of the box.
8. Flush the box and remove all traces of solvent by drying out the box with a rag. Replace the pipe plugs and/or fittings.
9. Refill both reservoirs with fresh PULSAlube oil. The level should be 1/2" to 3/4" from the top of each reservoir.
10. Reinstall the covers. Grease the slip joint and gearing on top of the oscillating housing prior to installing the rear cover. (Refer to Installation/Operation/Maintenance Manual MAINTENANCE Section XI).

PULSAlube TECHNICAL DATA

PULSAlube #1

Service Range

For service 40°F to 280°F

Nearest Commercial Equivalent

Exxon - Nuto Series

Shell - Tellus Series

Texaco - Rando Series

Gulf - Harmony Series

Typical Characteristics

API Gravity	-	28 - 30
Viscosity SSU @ 100°F	-	450 - 700
Viscosity SSU @ 210°F	-	73 - 78
Viscosity Index	-	95 - 160
Pour Point	-	15° to -25°F
Four Ball Wear Test		
1800 RPM 20KG Load, 130°F, 1 Hr	-	.30MM Scar Diameter
Timken OK Load	-	60 - 70 lb.
Rust Test (ASTM D-665)	-	Pass
Demulsibility Test (ASTM D-2711)	-	Pass
Oxidation Test (ASTM D-2893)	-	Pass

MATERIAL SAFETY DATA SHEET

PULSAlube #1

I. IDENTIFICATION AND EMERGENCY INFORMATION

Product Name: PULSAlube #1
Supplier - Pulsafeeder Inc., 2883 Brighton-Henrietta Town Line Road, Rochester, NY 14623, (716)292-8000
Emergency Telephone - (800) 424-9300, Chemtrec (Inquiries (716) 461-8310)
Chemical Name - Petroleum Lubricating Oil
CAS Number - Complex mixture, CAS not applicable
D.O.T. Hazard Class - N/A
D.O.T. I.D. Number - N/A
Labeling: NA
Miscellaneous: HMIS Code - Health - 1; Fire - 1; Reactivity - 0

II. PHYSICAL DATA

Boiling Point:	IBP > 200C
Odor:	Bland petroleum type
Appearance:	Light amber colored fluid
Specific Gravity:	(68° F) 0.86
Vapor Density (AIR=1):	Not Determined
Evaporation Rate:	Not Determined
Vapor Pressure:	Not Determined
Solubility in Water:	Nil
Pour, Congealing or Melting Point:	Not Determined
pH:	Not determined
Percent Volatile by Vol.:	Ni1 from open container after 4 hrs. - @ 100° F

III. HAZARDOUS INGREDIENTS

This material is not known to contain greater than 0.1% of any carcinogen required to be listed under OSHA Hazard Communication Standard (29CFR 1910.1200)

From 0.02-0.10 percent Long Chain alkenylamine
From 0.002-0.02 percent Long Chain alkenylamine
From 0.002-0.02 percent Toluene (CAS 108-88-3)
From 0.002-0.02 percent Ester Copolymer
From 0.02-0.08 percent Acrylic Polymer
Greater than 80% Petroleum Lubrication Oil Base Stock (CAS 64741-88-4)

Please note that the chemical identity of some or all of the above hazardous ingredients is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.

MATERIAL SAFETY DATA SHEET

PULSAlube #1

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (MINIMUM): >200 C (COC)
EXPLOSIVE LIMITS: (APPROX. % BY VOLUME IN AIR) Not determined
EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES: Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable depending on size or potential size of fire and circumstances related to the situation.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING:

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION: THEY MAY EXPLODE AND CAUSE INJURY OF DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner in compliance with applicable government regulations.

V. HEALTH HAZARD DATA

Variability among individuals
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mist or fumes should be minimized.

Effects of Overexposure (Signs and Symptoms of exposure): Prolonged or repeated skin contact may cause skin irritation.

Nature of Hazard: Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis. Product contacting the eyes may cause irritation.

Toxicity Information: Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

Pre-existing Medical Conditions Which May Be Aggravated By Exposure: None recognized.

VI. REACTIVITY DATA

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite. Oxides of carbon, sulfur, phosphorous, calcium and zinc will occur on thermal decomposition.

MATERIAL SAFETY DATA SHEET

PULSAlube #1

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken In Case Material Is Released Or Spilled: Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable governmental regulations.

VIII. SPECIAL PROTECTION INFORMATION

VENTILATION

Use local exhaust to capture vapor, mist, or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or build-up of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION

Normally not needed at ambient temperatures. Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant gloves, avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

IX. SPECIAL PRECAUTIONS

WORK PRACTICES/ENGINEERING CONTROLS

Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.

MATERIAL SAFETY DATA SHEET

PULSAlube #1

IX. SPECIAL PRECAUTIONS (CONTINUED)

PERSONAL HYGIENE

Minimize breathing vapors, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing. Cleanse skin thoroughly after contact, before breaks and meals and at end of work period. Product is readily removed from skin by waterless hand cleansers followed by washing thoroughly with soap and water.

X. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT

In case of skin contact, remove any contaminated clothing and wash skin with soap and water.

INHALATION

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from product immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION

If ingested, call a physician immediately.

XI. TRANSPORTATION INFORMATION

Transportation Incident Information

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation regulations.

The information presented herein has been compiled from sources considered to be dependable and is accurate to the best of seller's knowledge. However, since the conditions of handling and use are beyond our control, seller makes no warranty whatsoever, expressed, implied or of merchantability regarding the accuracy or completeness of such data or the results to be obtained from use thereof. Further, seller assumes no responsibility for injury to buyer or to third persons, or for damage to any property. Buyer assumes all such risks, including but not limited to compliance of user with all applicable Federal, State and Local laws and regulations. Further, nothing contained herein is to be construed as a recommendation for use in violation of any patent or applicable laws and regulations.