MATERIAL SAFETY DATA SHEET
FOR
POWER FLO

WHMIS – NOT CONTROLLED NOT CONTROLLED

SECTION 1: PRODUCT IDENTIFICATION AND USE

PRODUCT USE: HYDRAULIC FLUID **PRODUCT CODE**: POWER FLO

MANUFACTURER: FORSYTHE LUBRICATION ASSOCIATES LTD.
120 CHATHAM STREET
HAMILTON, ONTARIO
L8P 2B5 (905) 525-7192

SUPPLIER: TAPCO L.L.C.
28 OLD SHIPYARD LANE
HANOVER, MA, USA
02339 (800) 977-8562

SECTION 2: HAZARDOUS INGREDIENTS

ONLY THE INGREDIENTS PRECEDED BY A ** ARE CONTROLLED UNDER WHMIS

%	HAZARDOUS INGREDIENTS	UN/CAS #	LC 50	LD 50-ORAL (RATS)	LD 50-DERMAL (RABBITS)

SECTION 3: PHYSICAL DATA

VAPOUR PRESSURE (mm Hg):	14 at 20 C	EVAPORATION RATE:	0.9 (Butyl Acetate=1)
COEFFICIENT WATER/OIL DISTRIBUTION:	NOT DETERMINED	FREEZING POINT (° C):	NOT APPLICABLE (POUR PT. IS -63 C)
WATER SOLUBILITY:	100 % AT 20 C	PHYSICAL STATE:	LIQUID
VISCOSITY cSt @ 40 C:	46	pH:	9.1
BOILING POINT (°C):	107 AT 760 mm Hg	VAPOUR DENSITY:	1.2 (AIR=1)
ODOUR THRESHOLD (ppm):	NOT DETERMINED	SPECIFIC GRAVITY:	1.092
VOLATILE (%)	NOT AVAILABLE	ODOUR/APPEARANCE:	CLEAR BLUE COLOUR / MILD ODOUR

SECTION 4: FIRE AND EXPLOSION DATA

FLAMMABILITY? YES (X) NO ( ) **CONDITIONS?** THIS PRODUCT IS CONSIDERED NON-COMBUSTIBLE DUE TO ITS HIGH WATER CONTENT. THIS PRODUCT WILL BURN AFTER THE WATER IS GONE.

MEANS OF EXTINCTION: (X) CARBON DIOXIDE (X) DRY CHEMICAL (X) FOAM ( ) WATER STREAM ( ) FOG (SPRAY) (X) OTHER (SEE SPECIAL PROCEDURES)

FLASH POINT °C (METHOD): NONE **AUTO IGNITION POINT °C:** NOT CURRENTLY AVAILABLE
LOWER FLAMMABLE LIMIT (%VOL): NOT DETERMINED (AQUEOUS SYSTEM) **UPPER FLAMMABLE LIMIT (%VOL):** NOT DETERMINED (AQUEOUS SYSTEM)

COMBUSTION PRODUCTS: OXIDES OF CARBON, AND NITROGEN.

SENSITIVITY TO IMPACT: NONE **SENSITIVITY TO STATIC DISCHARGE:** NONE

SPECIAL PROCEDURES: APPLY ALCOHOL-TYPE OR ALL PURPOSE-TYPE FOAM BY MANUFACTURER'S RECOMMENDED TECHNIQUES FOR LARGE FIRES. USE CARBON DIOXIDE OR DRY CHEMICAL MEDIA FOR SMALL FIRES. DO NOT DIRECT A SOLID STREAM OF WATER OR FOAM INTO HOT, BURNING POOLS: THIS MAY CAUSE FROTHING AND INCREASE FIRE INTENSITY. USE SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

SECTION 5: REACTIVITY DATA

CHEMICAL STABILTY? YES (X)
NO ( )

CONDITIONS? WARNING. DO NOT MIX THIS PRODUCT WITH NITRITES OR NITROSATING AGENTS BECAUSE NITROSAMINES MAY BE FORMED, WHICH MAY CAUSE CANCER.

INCOMPATIBILITY WITH OTHER PRODUCTS? YES (X)
NO ( )

SPECIFY? AVOID STRONG BASES AT HIGH TEMPERATURES, STRONG ACIDS, STRONG OXIDIZING AGENTS AND MATERIALS WITH HYDROXYL COMPOUNDS.

REACTIVITY, UNDER WHAT CONDITIONS? NON REACTIVE

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON, AND NITROGEN.

SECTION 6: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY: SKIN (X) EYES (X) INHALATION (X) INGESTION (X)

EFFECTS OF ACUTE EXPOSURE TO PRODUCT:
SWALLOWING: MODERATELY HIGH TOXICITY. MAY CAUSE PAIN OR DISCOMFORT IN TH ABDOMEN, PAIN IN THE LUMBAR REGION, NAUSEA, VOMITING, DIARRHEA, DIZZINESS, DROWSINESS, DECREASED URINE PRODUCTION, MALAISE, AND LOSS OF CONSCIOUSNESS. SEVERE KIDNEY DAMAGE MAY OCCUR. INHALATION: SHORT -TERM HARMFUL HEALTH EFFECTS ARE NOT EXPECTED FROM VAPOUR GENERATED AT AMBIENT TEMPERATURE. VAPOUR OR MIST FROM HEATED MATERIAL MAY CAUSE NAUSEA AND HEADACHE. SKIN CONTACT: BRIEF CONTACT IS NOT IRRITATING. PROLONGED CONTACT MAY CAUSE REDDENING, ITCHINESS, A BURNING SENSATION, AND POSSIBLE DRYING AND FLAKING OF THE SKIN. EYE CONTACT: MAY CAUSE IRRITATION, EXPERIENCED AS STINGING WITH EXCESS BLINKING AND TEAR PRODUCTION. EXCESS REDNESS AND SWELLING OF THE CONJUCTIVA MAY OCCUR. VAPOUR MAY CAUSE TEMPORARY DISTURBANCE OF VISION.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:
EXPOSURE TO VAPOURS GENERATED AT HIGH TEMPERATURES MAY RESULT IN EYE AND RESPIRATORY TRACT IRRITATION, DIZZINESS, NAUSEA, AND THE INHALATION OF HARMFUL AMOUNTS OF MATERIAL. SHORT-TERM REPEATED INGESTION OF DIETHYLENE GLYCOL MAY PRODUCE RENAL FAILURE. SKIN CONTACT MAY CAUSE SENSITIZATION AND AN ALLERGIC SKIN REACTION. REPEATED EXPOSURE TO VAPOUR OR MIST MAY CAUSE HEADACHE, NAUSEA AND DIZZINESS.

LD 50 – (ORAL) :	12,565 mg/kg	EXPOSURE LIMITS:	50 ppm TWA8 AIHA WEEL (vapour and aerosol)
LD 50 – (DERMAL):	11,890 mg/kg	IRRITANCY OF PRODUCTS:	MODERATE
LC 50 – (INHALATION):	NOT DETERMINED		
SENSITIZATION:	NON SENSITIZER	MUTAGENICITY:	NONE
REPRODUCTIVE TOXICITY:	SEE ADDITIONAL INFORMATION	CARCINOGENICITY:	NON CARCINOGENIC
TERATOGENICITY:	NON TERATOGENIC	SYNERGISTIC PRODUCTS:	NITRITES

ADDITIONAL INFORMATION: DO NOT ADD NITRITES OR OTHER NITROSATING AGENTS, DUE TO THE POSSIBLE FORMATION OF NITROSAMINES (POTENTIAL CARCINOGENS).

A CHRONIC DIETARY FEEDING STUDY OF DIETHYLENE GLYCOL WITH RATS SHOWED MILD KIDNEY INJURY AT 1%, WHILE CONCENTRATIONS OF 2% AND 4% OF DIETHYLENE GLYCOL IN THE DIET. SOME RATS DEVELOPED BENIGN PAPILLARY TUMOURS IN THE URINARY BLADDER. THESE HAVE BEEN ATTRIBUTED TO THE PRESENCE OF URINARY BLADDER CALCIUM OXALATE STONES. NO EVIDENCE FOR CARCINOGENICITY WAS FOUND WITH A CHRONIC SKIN-PAINTING STUDY WITH DIETHYLENE GLYCOL IN MICE. THE ABSENCE OF A DIRECT CHEMICAL CARCINOGENIC EFFECT ACCORDS WITH THE RESULTS OF IN VITRO GENOTOXICITY STUDIES WHICH SHOW THAT IT DOES NOT PRODUCE MUTAGENIC OR CLASTOGENIC EFFECTS. A FEEDING STUDY EMPLOYING UP TO 5.0% DIETHYLENE GLYCOL IN THE DIET FAILED TO PRODUCE ANYTERATOGENIC EFFECTS.

IN A MOUSE CONTINOUS BREEDING STUDY WITH LARGE DOSES OF DIETHYLENE GLYCOL IN DRINKING WATER, THERE WAS EVIDENCE FOR REPRODUCTIVE TOXICITY AT 3.5% (EQUIVALENT TO 6.1 g/kg/day) AS REDUCED NUMBER OF LITTERS, LIVE PUPS PER LITTER, AND LIVE PUP WEIGHT. NO SUCH EFFECTS WERE SEEN AT 1.75% (APPROXIMATELY 3.05 g/kg/day). THE RELEVANCE OF THESE VERY HIGH DOSAGES TO HUMAN HEALTH IS UNCERTAIN.

PREGNANT RATS RECEIVING UNDILUTED DIETHYLENE GLYCOL BY GAVAGE OVER THE PERIOD OF ORGANOGENESIS HAD TOXIC EFFECTS AT 4.0 AND 8.0 ml/kg/day AS MORTALITY, DECREASED BODY WEIGHT, DECREASED FOOD CONSUMPTION, INCREASED WATER CONSUMPTION, AND INCREASED LIVER AND KIDNEY WEIGHTS. FOETOXICITY WAS SEEN ONLY AT THESE MATERNALLY TOXIC DOSAGES. DECREASED FOETAL BODY WEIGHT OCCURRED AT 8.0 ml/kg day, AND INCREASED SKELETAL VARIANTS AT 4.0 AND 8.0 ml/kg day. NO EMBRYOTOXIC OR TERATOGENIC EFFECTS WERE SEEN. NEITHER MATERNAL TOXICITY NOR FOETOXICITY OCCURRED AT 1.0 ml/kg day. IN A STUDY WITH MICE ALSO RECEIVING UNDILUTED DIETHYLENE GLYCOL OVER THE PERIOD OF ORGANOGENESIS, MATERNAL TOXICITY OCCURRED AT 2.5 AND 10.0 ml/kg/day, BUT NOT AT 0.5 ml/kg/day. DEFINITIVE DEVELOPMENTAL TOXICITY WAS NOT SEEN IN THIS SPECIES.

CONTAINS ONE OR MORE AMINES WHICH MAY REACT WITH NITRITES TO FORM NITROSAMINES. SOME NITROSAMINES HAVE BEEN SHOWN TO BE CARCINOGENIC IN LABORATORY ANIMALS. THE RELEVANCE OF THESE FINDINGS TO HUMANS IS UNKNOWN.

SECTION 7: PREVENTATIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT:	EXPOSURE TO HIGH CONCENTRATIONS OF MIST OR VAPOUR REQUIRES THE WEARING OF SUITABLE RESPIRATORY EQUIPMENT. (ie. NIOSH APPROVED WITH ORGANIC VAPOUR CARTRIDGE). WEAR GOGGLES OR FACE SHIELD AND PVC GLOVES WHEN HANDLING.
ENGINEERING CONTROLS:	USE WITH ADEQUATE VENTILATION AND KEEP AIRBORNE CONCENTRATIONS WITHIN THE RECOMMENDED LIMITS.
LEAK AND SPILL PROCEDURES:	ABSORB RESIDUE WITH AN INERT ABSORBENT. SHOVEL INTO WASTE CONTAINER AND DISPOSE. PREVENT MATERIAL FROM ENTERING DRAINS, SEWERS, OR WATERWAYS.
WASTE AND DISPOSAL:	USE STANDARD WASTE DISPOSAL PROCEDURES IN ACCORDANCE WITH LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.
HANDLING PROCEDURES AND EQUIPMENT:	THE WATER CONTENT OF THIS PRODUCT MUST BE MONITORED AND MAINTAINED IN ORDER TO REMAIN NON- COMBUSTIBLE. WASH THOROUGHLY AFTER HANDLING.
STORAGE REQUIREMENTS:	STORE IN COOL, WELL VENTILATED AREA. KEEP CONTAINER CLOSED. STORE UNDER CONDITIONS WHERE WATER EVAPORATION IS MINIMIZED.
SPECIAL SHIPPING INFORMATION:	NOT REGULATED BY TDGR.

SECTION 8: FIRST AID MEASURES

EYE CONTACT:	FLUSH WITH WATER FOR 15 MINUTES. REMOVE CONTACT LENS, IF WORN. SEEK MEDICAL ATTENTION.
SKIN CONTACT:	WASH WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE. SEEK MEDICAL ATTENTION, IF IRRITATION DEVELOPS.
INHALATION:	REMOVE VICTIM TO FRESH AIR.
ASPIRATION / INGESTION:	OBTAIN MEDICAL ATTENTION IMMEDIATELY. IF PATIENT IS FULLY CONSCIOUS, GIVE 2 GLASSES OF WATER AND DO NOT INDUCE VOMITING.

NOTE TO PHYSICIAN:

IT IS ESTIMATED THAT THE LETHAL ORAL DOSE OF DIETHYLENE GLYCOL TO ADULTS IS OF THE ORDER OF 1.0 – 1.2 ml/kg. DIETHYLENE GLYCOL PRODUCES METABOLITES THAT CAUSE AN ELEVATED ANION-CAP METABOLIC ACIDOSIS AND RENAL TUBULAR INJURY. LIVER INJURY MAY OCCUR, BUT NOT AS SEVERE AS KIDNEY INJURY. THE SIGNS AND SYMPTOMS IN DIETHYLENE GLYCOL POISONING ARE THOSE OF METABOLIC ACIDOSIS, CNS DEPRESSION, AND KIDNEY INJURY. URINALYSIS MAY SHOW ALBUMINURIA, HEMATURIA, AND OXALURIA.

THE CURRENTLY RECOMMENDED MEDICAL MANAGEMENT OF DIETHYLENE GLYCOL POISONING INCLUDES ELIMINATION DIETHYLENE GLYCOL AND ITS METABOLITES, CORRECTION OF METABOLIC ACIDOSIS, AND PREVENTION OF KIDNEY INJURY. IT IS ESSENTIAL TO HAVE IMMEDIATE AND FOLLOW-UP URINALYSIS AND CLINICAL CHEMISTRY. THERE SHOULD BE PARTICULAR EMPHASIS ON ACID-BASE BALANCE, AND LIVE AND KIDNEY FUNCTION TESTS. A CONTINUOUS INFUSION OF 5% SODIUM BICARBONATE WITH FREQUENT MONITORING OF ELECTROLYTES AND FLUID BALANCE STATUS IS USED TO ACHIEVE CORRECTION OF METABOLIC ACIDOSIS AND FORCED DIURESIS. FOR SEVERE AND/OR DETERIORATING CASES, HEMODIALYSIS MAY BE REQUIRED. DIALYSIS SHOULD BE CONSIDERED FOR PATIENTS WHO ARE SYMPTOMATIC, HAVE SEVERE METABOLIC ACIDOSIS, A BLOOD DIETHYLENE GLYCOL CONCENTRATION GREATER THAN 25 mg/dl, OR COMPROMISE OF RENAL FUNCTION. THERE ARE NO REPORTED CASES IN WHICH ETHANOL HAS BEEN USED ANTIDOTALLY, ALTHOUGH A LIMITED NUMBER OF LABORATORY ANIMAL STUDIES SUGGEST THAT IT MAY BE EFFECTIVE. IF USED CLINICALLY, A THERAPEUTICALLY EFFECTIVE BLOOD CONCENTRATION IS PROBABLY AROUND 100 - 150mg/dl, ALTHOUGH THIS IS UNPROVEN: THIS CONCENTRATION SHOULD BE ACHIEVED BY A RAPID LOADING DOSE AND MAINTAINED BY INTRAVENOUS INFUSION. ONE ANIMAL STUDY HAS SUGGESTED THAT PYRAZOLE MAY BE AN EFFECTIVE EARLY ANTIDOTE, BUT ITS VALUE IN HUMAN DIETHYLENE GLYCOL POISONING IS UNPROVEN.

EXPOSURE TO THE VAPOUR MAY CAUSE MINOR TRANSIENT EDEMA OF THE CORNEAL EPITHELIUM. THIS CONDITION, REFERRED TO AS "GLAUCOPSIA", "BLUE-GRAY HAZE", PRODUCES A BLURRING OF VISION AGAINST A GENERAL BLUISH HAZE AND THE APPEARANCE OF HALOS AROUND BRIGHT OBJECTS. THE EFFECT DISAPPEARS SPONTANEOUSLY WITHIN A FEW HOURS OF THE END OF AN EXPOSURE AND LEAVES NO SEQUELAE. ALTHOUGH NOT DETRIMENTAL TO THE EYE PER SE, GLAUCOPSIA PREDISPOSES AN AFFECTED INDIVIDUAL TO PHYSICAL ACCIDENTS AND REDUCES THE ABILITY TO UNDERTAKE SKILLED TASKS, SUCH AS DRIVING A MOTORIZED VEHICLE.