WINSHIELD WASHER FLUID

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2487897
PRODUCT NAME(S) : WINDSHIELD WASHER FLUID
PRODUCT IDENTIFICATION : PRODUCT CODE R00072260000
DATE OF MSDS : 1999-06-29
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-18

*** MANUFACTURER INFORMATION ***

MANUFACTURER : SUN COMPANY, INC
ADDRESS : Ten Penn Center
1801 Market Street
Philadelphia Pennsylvania
U.S.A. 19103-1699
Telephone: 215-977-6182 (Joanne Houck)
EMERGENCY TELEPHONE NO. : 800-964-8861 (SUN COMPANY, AFTER NORMAL BUSINESS HOURS)
800-424-9300 (CHEMTREC, AFTER NORMAL BUSINESS HOURS)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

REVISION DATE: 06/29/1999
UN NUMBER- UN1993

PRIMARY APPLICATION- WINDSHIELD WASHER FLUID

MANUFACTURER- SUN COMPANY, INC.
TEN PENN CENTER
1801 MARKET STREET
PHILADELPHIA PA 19103-1699

SYNONYMS..... : WINDSHIELD WASHER PREMIX
CAS REGISTRY NO: SEE SEC. 2
CAS NAME..... : NO CLASSIFICATION - MIXTURE
CHEMICAL FAMILY: BLEND
INFORMATION
SUPPLIER.. JOANNE HOUCK
PHONE.... : (610) 859-1120

EMERGENCY PHONE NUMBERS (AFTER NORMAL BUSINESS HOURS)
SUN CO.. 1-800-964-8861

CHEMTREC. 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT/CAS NO.	LO%	HI%	EXPOSURE GUIDELINES OSHA TWA	OSHA STEL	ACGIH TWA	ACGIH STEL	SUN/MFR TWA	SUN/MFR STEL	UNIT
LIMITS FOR THE PRODUCT:			NO SPECIFIC LIMIT						
METHANOL									
67-56-1	35.00	45.00	200	250	200	250			PPM
WATER									
7732-18-5	55.00	65.00	NO SPECIFIC LIMIT						
C.I. ACID BLUE 9									
3844-45-9	.00	1.00	NO SPECIFIC LIMIT						

ADDITIONAL EXPOSURE LIMITS ---------- GOVERNMENT REGULATION
OTHER LIMIT- SEE SECTION 2

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW ----------

DANGER] FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. HIGH VAPOR CONCENTRATIONS MAY CAUSE DIZZINESS. MAY CAUSE SKIN IRRITATION. CAUSES EYE IRRITATION. POISON] MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. MAY CAUSE SEVERE CHRONIC TOXICITY.

APPEARANCE-- CLEAR BLUE LIQUID ODOR-- MILD ALCOHOL ODOR

POTENTIAL HEALTH EFFECTS ----------

PRIMARY ROUTES OF ENTRY- INHALATION(X) SKIN(X) EYE(X) INGESTION(X)

INHALATION ----------
EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE, THROAT, LUNGS; RESPIRATORY TRACT; CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS; HEADACHES, NAUSEA; DIZZINESS, LOSS OF BALANCE AND COORDINATION; UNCONSCIOUSNESS, COMA; RESPIRATORY FAILURE AND DEATH. REPEATED EXCESSIVE EXPOSURES MAY CAUSE LIVER EFFECTS OR DAMAGE. KIDNEY EFFECTS OR DAMAGE.

SKIN ----------
SKIN ABSORPTION OF MATERIAL MAY PRODUCE SYSTEMIC TOXICITY. MAY CAUSE MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT. REMOVES NATURAL OILS & FATS FROM SKIN.

EYE ----------
CONTACT WITH THE EYE MAY CAUSE MODERATE IRRITATION. CORNEAL DAMAGE OR OPACITY.

INGESTION ----------
HARMFUL OR FATAL IF SWALLOWED. CANNOT BE MADE NON-POISONOUS. INGESTION OF THIS MATERIAL MAY CAUSE BLINDNESS; CENTRAL NERVOUS SYSTEM (BRAIN)

EFFECTS; NAUSEA, VOMITING AND DIARRHEA; INGESTION OF THIS MATERIAL MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM (BRAIN); VISION; LIVER; KIDNEYS;

CARCINOGEN LISTED BY-IARC(NO) NTP(NO) OSHA(NO) ACGIH(NO) OTHER(NO)

PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
DISORDERS OR DISEASES OF THE SKIN, EYE, LIVER, KIDNEY, RESPIRATORY, PULMONARY AND LUNG (E.G. ASTHMA-LIKE CONDITIONS).

4. FIRST AID MEASURES

INHALATION ----------
MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.

SKIN ----------
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. IF REDNESS OR SWELLING DEVELOPS, OBTAIN MEDICAL ASSISTANCE. IMMEDIATELY REMOVE SOAKED CLOTHING. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

EYE ----------
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ASSISTANCE.

INGESTION ----------
GIVE LIQUIDS AND INDUCE VOMITING UNLESS VICTIM IS UNCONSCIOUS. IF INDIVIDUAL IS CONSCIOUS, GIVE MILK OR WATER TO DILUTE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VICTIM IS CONSCIOUS AND ALERT VOMITING SHOULD BE INDUCED BY OR UNDER THE DIRECTION OF A PHYSICIAN OR POISON CONTROL CENTER. OBTAIN EMERGENCY MEDICAL ATTENTION.

5. FIRE FIGHTING MEASURES

FLASH POINT: 98 (DEG. F); 36 (DEG. C)
AUTOIGNITION TEMP.: NOT DETERMINED (DEG. F); NOT DETERMINED (DEG. C)

---FLAMMABLE LIMITS IN AIR---
LOWER EXPLOSIVE LIMIT (LEL): NOT DETERMINED % VOLUME
UPPER EXPLOSIVE LIMIT (UEL): NOT DETERMINED % VOLUME

FIRE AND EXPLOSION HAZARDS ----------
FLAMMABLE LIQUID (FLASH POINT LESS THAN 100F)

EXTINGUISHING-MEDIA ----------
WATER SPRAY. ALCOHOL RESISTANT FOAM. DRY CHEMICAL. CARBON DIOXIDE.

SPECIAL FIRE FIGHTING INSTRUCTIONS ---------
USE WATER SPRAY. COOL TANK/ CONTAINER. WEAR SELF-CONTAINED BREATHING APPARATUS. WEAR STRUCTURAL FIREFIGHTERS PROTECTIVE CLOTHING.

NFPA/HMIS CLASSIFICATION HAZARD RATING

HEALTH - 1 / 1
FIRE - 2 / 2
REACTIVITY - 0 / 0
PERSONAL PROTECTION INDEX - X

0=LEAST 1=SLIGHT
2=MODERATE 3=HIGH
4=EXTREME

SPECIFIC HAZARD: FLAMMABLE

6. ACCIDENTAL RELEASE MEASURES

PREVENT IGNITION; STOP LEAK; VENTILATE AREA. CONTAIN SPILL. USE WATER SPRAY TO DISPERSE VAPORS. KEEP UPWIND OF LEAK. USE PERSONAL PROTECTIVE EQUIPMENT STATED IN SECTION 8. ADVISE EPA; STATE AGENCY IF REQUIRED. ABSORB ON INERT MATERIAL. SHOVEL, SWEEP OR VACUUM SPILL.

7. HANDLING AND STORAGE

KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP IN COOL, DRY PLACE. KEEP CONTAINER TIGHTLY CLOSED. KEEP IN WELL VENTILATED SPACE. STORAGE HAS TEMPERATURE LIMITS--SEE STABILITY. NFPA CLASS 1C STORAGE. CONSULT NFPA AND OSHA CODES. TRANSFER OPERATIONS MUST BE ELECTRICALLY GROUNDED TO DISSIPATE STATIC BUILDUP. AVOID PROLONGED BREATHING OF MIST OR VAPOR. AVOID CONTACT WITH THIS MATERIAL. AVOID CONTACT WITH EYES. WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONSULT WITH A HEALTH/SAFETY PROFESSIONAL FOR SPECIFIC SELECTION.

VENTILATION ----------
USE ONLY WITH ADEQUATE VENTILATION. VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT. EXPLOSION PROOF VENTILATION EQUIPMENT REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT ----------
EYE ----------
SPLASH PROOF CHEMICAL GOGGLES OR FULL FACE SHIELD RECOMMENDED TO PROTECT AGAINST SPLASH OF PRODUCT.

GLOVES ----------
PROTECTIVE GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE AVOIDED. THE FOLLOWING GLOVE MATERIALS ARE ACCEPTABLE: POLYETHYLENE; NEOPRENE; NITRILE; POLYVINYL ALCOHOL; VITON; NATURAL RUBBER;

RESPIRATOR ----------
CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION. HALF-MASK AIR PURIFYING RESPIRATOR

WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 10 TIMES THE EXPOSURE LIMIT. FULL-FACE AIR PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 50 TIMES THE EXPOSURE LIMIT NOT TO EXCEED THE CARTRIDGE LIMIT OF 1000 PPM. PROTECTION BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR OR SCBA FOR EXPOSURES ABOVE 50X THE EXPOSURE LIMIT. IF EXPOSURE IS ABOVE IDLH(IMMEDIATELY DANGEROUS TO LIFE & HEALTH) OR THERE IS THE POSSIBILITY OF AN UNCONTROLLED RELEASE OR EXPOSURE LEVELS ARE UNKNOWN THEN USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR WITH ESCAPE BOTTLE OR SCBA.

OTHER ----------

IF CONTACT IS UNAVOIDABLE, WEAR CHEMICAL RESISTANT CLOTHING. THE FOLLOWING MATERIALS ARE ACCEPTABLE AS PROTECTIVE CLOTHING MATERIALS: POLYETHYLENE; POLYVINYL ALCOHOL(PVA); NEOPRENE; NITRILE; VITON; SAFETY SHOWER AND EYE WASH AVAILABILITY RECOMMENDED. LAUNDER SOILED CLOTHES. FOR NON-FIRE EMERGENCIES, POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) & STRUCTURAL FIREFIGHTERS' PROTECTIVE CLOTHING WILL PROVIDE LIMITED PROTECTION.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT.....	148 (DEG. F)	64	(DEG. C)
MELTING POINT.....	N.D. (DEG. F)	N.D.	(DEG. C)
SPECIFIC GRAVITY...	0.97 (WATER=1)		
PACKING DENSITY....	N/A (KG/M3)		
VAPOR PRESSURE.....	97.68 (MM HG @ 20 DEG C)		
VAPOR DENSITY.....	N/A (AIR=1)		
SOLUBILITY IN WATER.	100% (% BY VOLUME)		
PH INFORMATION.....	N.D. AT CONC. N.D. G/L H2O		
% VOLATILES BY VOL..	N/A		
EVAPORATION RATE...	N/A (ETHYL ETHER=1)		
OCTANOL/WATER COEFF.	N.D.		
APPEARANCE.....	CLEAR BLUE LIQUID		
ODOR.....	MILD ALCOHOL ODOR		
ODOR THRESHOLD.....	N.D. (PPM)		
VISCOSITY.....	N.D. SUS @ N.D DEG F ... N.D. CST @ N.D DEG C		
MOLECULAR WEIGHT...	N.D. (G/MOLE)		

10. STABILITY AND REACTIVITY

STABILITY ----------

STABLE

CONDITIONS TO AVOID-

HEAT, SPARKS AND OPEN FLAMES. STORE AT TEMPERATURES BELOW 120 DEG F.

INCOMPATIBLE MATERIALS ----------

STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION ----------
COMBUSTION WILL PRODUCE CARBON MONOXIDE AND ASPHYXIANTS
POLYMERIZATION ----------
WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION

FOR THE PRODUCT ----------
INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. IF SWALLOWED CAN CAUSE BLINDNESS, SEVERE GASTROINTESTINAL TRACT IRRITATION, CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

METHANOL (COMPONENT)
INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. LC50 (RAT) 4HR:64000 PPM. IF SWALLOWED, MAY CAUSE BLINDNESS, SEVERE GI IRRITATION CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

WATER (COMPONENT)
INHALATION: NON-TOXIC UNDER USUAL CIRCUMSTANCES. ENTRY OF WATER INTO THE LUNGS EXCLUDES OXYGEN AND ACTS AS AN ASPHYXIANT, AND CAN CAUSE DEATH (DROWNING). SKIN: MINIMAL IRRITATION WITH PROLONGED OR REPEATED CONTACT. WHEN HEATED, MAY CAUSE THERMAL BURNS TO SKIN AND EYE. ORAL: NON-TOXIC.

C.I. ACID BLUE 9 (COMPONENT)
NO DATA AVAILABLE FOR ANY ROUTE OF EXPOSURE.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA----------

NO DATA AVAILABLE.

13. DISPOSAL CONSIDERATIONS

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. RCRA HAZARDOUS WASTE. DO NOT FLUSH TO DRAIN/ STORM SEWER. CONTRACT TO AUTHORIZED DISPOSAL SERVICE.

14. TRANSPORTATION INFORMATION

DOT-
PROPER SHIPPING NAME- FLAMMABLE LIQUID, N.O.S. (CONTAINS METHANOL)
HAZARD CLASS- 3 (FLAMMABLE LIQUID)
IDENTIFICATION NUMBER- UN1993
LABEL REQUIRED- PG II, FLAMMABLE LIQUID

IMDG- PROPER SHIPPING NAME- NO DATA AVAILABLE

IATA- PROPER SHIPPING NAME- NO DATA AVAILABLE

15. REGULATORY INFORMATION

SARA 302 THRESHOLD PLANNING QUANTITY. N/A

SARA 304 REPORTABLE QUANTITY ..... 11111 POUNDS

SARA 311 CATEGORIES- IMMEDIATE (ACUTE) HEALTH EFFECTS.. Y
DELAYED (CHRONIC) HEALTH EFFECTS.. Y
FIRE HAZARD ..... Y
SUDDEN RELEASE OF PRESSURE HAZARD. N
REACTIVITY HAZARD ..... N

WHEN A PRODUCT AND/OR COMPONENT IS LISTED BELOW, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

METHANOL - CT MA NJ PA RI WV 01 07

01=SARA 313	02=SARA 302/304	03=IARC CARCINOGEN
04=OSHA CARCINOGEN	05=ACGIH CARCINOGEN	06=NTP CARCINOGEN
07=CERCLA 302.4	08=WHMIS CONTROLLED PROD.	
10=OTHER CARCINOGEN		
PA=PENNSYLVANIA RTK	NJ=NEW JERSEY RTK	CA=CALIFORNIA PROP 65
MA=MASSACHUSETTS RTK	MI=MICHIGAN 406	MN=MINNESOTA RTK
FL=FLORIDA	RI=RHODE ISLAND	IL=ILLINOIS
NY=NEW YORK	WV=WEST VIRGINIA	CT=CONNECTICUT
LA=LOUISIANA	ME=MAINE	OH=OHIO

THIS PRODUCT OR ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE U.S. TSCA INVENTORY.

16. OTHER INFORMATION

WINSHIELD WASHER FLUID

NONE

XANTHATE POTASSIUM AMYL

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2494557
PRODUCT NAME(S) : Xanthate Potassium Amyl
PRODUCT IDENTIFICATION : Code LA1352
DATE OF MSDS : 1999-03-25
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-20

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : VAN WATERS & ROGERS LTD
ADDRESS : 9800 Van Horne Way
Richmond British Columbia
Canada V6X 1W5
EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

Xanthate Potassium Amyl LA1352 1 99-03-25EEE
LA1352.1 Xanthate Potassium Amyl

VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B C. V6X 1W5

WHMIS CODES: B.6 D.1B

For Emergency Assistance
Involving Chemicals Call
CHEMTREC (800) 424-9300

WHMIS (Classification)
WHMIS CLASS B-6: Reactive and very flammable material.
WHMIS CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).

Section I. Chemical Product Identification

Product Name	Xanthate Potassium Amyl		
		Code	LA1352
		CAS#	Not applicable.
Synonym	Not available.		
		DSL	On the DSL list.
Chemical Name	Not applicable.		
		CI#	Not available.
Chemical Family	Not available.		
Chemical Formula	Not applicable.		
Material Uses	Not available.		

Section II. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits TLV/PEL	LC50/LD50
Potassium amyl xanthate	002720732	60-100	Not available.	ORAL (LD50): Acute: 1000 mg/kg [Rat].
Potassium Hydroxide	001310583	1-5	CEIL: 2 (mg/m3) from ACGIH (TLV) TWA: 2 (mg/m3)	ORAL (LD50): Acute: 273 mg/kg [Rat].
Isoamyl alcohol	000123513	1-5	TWA: 100 CEIL: 125 (ppm) from ACGIH (TLV) TWA: 360 CEIL: 450 (mg/m3)	ORAL (LD50): Acute: 3438 mg/kg [Rabbit]. 1300 mg/kg [Rat].

Section III. Hazards Identification

Potential Acute Health Effects	Extremely hazardous in case of skin contact (corrosive). Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects	Extremely hazardous in case of skin contact (corrosive). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Hazardous Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	Allow the victim to rest in a well-ventilated area. Seek immediate medical attention.
Hazardous Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	DO NOT induce vomiting. Examine the lips and mouth to

	ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Hazardous Ingestion	No additional information.

Section V. Fire and Explosion Data

The Product is:	Flammable.
Auto-Ignition Temperature	Not available.
Flash Points	Not available.
Flammable Limits	LOWER: 1.25% UPPER: 50%
Products of Combustion	These products are carbon oxides (CO, CO2), sulfur oxides (SO2, SO3..). Some metallic oxides.
Fire Hazards in Presence of Various Substances	Flammable in presence of heat, of oxidizing materials.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of oxidizing materials.
Fire Fighting Media and Instructions	Flammable solid. SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	Vapors or dust may explode.

Section VI. Accidental Release Measures

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.
Large Spill	Spontaneously combustible solid. Stop leak if without risk. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Obtain advice on use of water as spilled material may react with it. DO NOT touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Cover with WET earth, sand or other non-combustible material. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section VII. Handling and Storage

Precautions	Keep locked up. DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids.
Storage	Keep container tightly closed. Keep in a cool and well-ventilated area. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves.
Personal Protection in Case of a Large	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested

Spill	protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	Potassium Hydroxide CEIL: 2 (mg/m3) from ACGIH (TLV) TWA: 2 (mg/m3) Isoamyl alcohol TWA: 100 CEIL: 125 (ppm) TWA: 360 CEIL: 450 (mg/m3) Consult local authorities for acceptable exposure limits.

Section IX. Physical and Chemical Properties

Physical State and Appearance	Solid.	Odor	Sulfurous.
		Taste	Not available.
Molecular Weight	Not applicable.	Color	Yellow. Yellow to Green.
pH (1% soln/water)	10.5 [Basic.]		
Boiling Point	Not available.		
Melting Point	380 C (716 F) based on data for: Potassium Hydroxide.		
Critical Temperature	Not available.		
Specific Gravity	Weighted average: 1.16 (Water = 1)		
Vapor Pressure	The highest known value is 0 mm of Hg (@ 20 C) (Potassium Hydroxide).		
Vapor Density	Not available.		
Volatility	<20% (v/v).		
Odor Threshold	Not available.		
Evaporation rate	Not available.		
Viscosity	Not available.		
Water/Oil Dist. Coeff.	Not available.		

Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water.
Solubility	Soluble in cold water. Insoluble in diethyl ether.

Section X. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Solid xanthates are stable when kept cool and dry, exposure to heat causes decomposition. Acids and oxdizing agents accelerate aging. In solution, xanthates will decompose slowly even at room temperature.
Incompatibility with various substances	Highly reactive with metals. Reactive with oxidizing agents, acids.
Corrosivity	Highly corrosive in presence of aluminum, of zinc, of copper.
Special Remarks on Reactivity	Hazardous Decomposition Products: Carbon disulphide, trithiocarbonate, amyl alcohol.
Special Remarks on Corrosivity	No additional remark.
Hazardous Polymerization	No.

Section XI. Toxicological Information

Routes of Entry	Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 273 mg/kg [Rat]. (Potassium Hydroxide). Acute dermal toxicity (LD50): 3220 mg/kg [Rabbit]. (Isoamyl alcohol).
Chronic Effects on Humans	Extremely hazardous in case of skin contact (corrosive). CARCINOGENIC EFFECTS: Not available.

	MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Other Toxic Effects on Humans	Extremely hazardous in case of skin contact (corrosive). Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Special Remarks:	No additional remarks on Toxicity to Animals
Special Remarks:	No additional remarks on Chronic Effects on Humans
Special Remarks:	No additional remarks on other Toxic Effects on Humans

Section XII. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	No additional remark.

Section XIII. Disposal Considerations

Waste Disposal	Recycle, if possible. Consult your local or regional authorities.

Section XIV. Transport Information

TDG Classification	TDG CLASS 4.2: Spontaneously combustible substance.
Shipping name	Xanthates
PIN	UN3342
Packing Group	III
Special Provisions for Transport	No additional remark.

Section XV. Other Regulatory Information

Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Section XVI. Other Information

References	Not available.
Other Special Considerations	No additional remark.

Verified by Hardev Bendick.

Validated by Hardev Bendick on 2/19/99.

Information Contact	EH&S Department Vancouver, B C. (604) 273-1441

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Notice to Reader

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========== END OF MSDS ==========

ZINC CONCENTRATE

teckcominco

MATERIAL SAFETY DATA SHEET

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Polaris Zinc Concentrate

Manufacturer:
Cominco Mining Partnership
Polaris Operations
Polaris, N.W.T.
X0A 0Y0
Emergency Telephone: (250) 364-4214

Supplier:
Teck Cominco Metals Ltd.
1500 - 120 Adelaide Street, W.
Toronto, Ontario
M5H 1T1

MSDS Preparer:
Teck Cominco Metals Ltd.
600 - 200 Burrard Street
Vancouver, British Columbia
V6C 3L7

Date of MSDS Preparation: July 23, 1997

Product Use: Zinc concentrate is used in the production of zinc metal and zinc alloys.

SPECIAL NOTES:
Caution: The toxicological properties of this material have not been fully investigated. The information contained in this MSDS is based on information in the technical and scientific literature about the material's constituent compounds. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Exposure Limits*		LD_{50}/LC_{50} Species and Route	
Zinc Sulfide	89 to 97	1314-98-3	OSHA PEL**	None established	Human-inh TCLo	124 mg/m^3/50M
			ACGIH TLV**	None established	Rat-oral LD_{50}	>2 gm/kg
			NIOSH REL**	None established	Rat-inh LC_{50}	>5040 mg/m^3/4H
					Rat-skin LD_{50}	>2 gm/kg
Iron Sulfide	2 to 4	7439-89-6	OSHA PEL***	None established	No data	
			ACGIH TLV***	None established		
			NIOSH REL***	None established		
Lead Sulfide	1 to 2	1314-87-0	OSHA PEL	0.05 mg/m^3	Guinea Pig-oral LDLo 10 gm/kg	
			ACGIH TLV	0.05 mg/m^3		
			NIOSH REL	<0.1 mg/m^3		

NOTE: TLVs for individual states may differ from OSHA TLVs. Check with local authorities for the applicable state TLVs.
*OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health.
**The OSHA PEL for zinc oxide dust is 15 mg/m^3 total and 5 mg/m^3 respirable. The ACGIH TLV for zinc oxide dust is 10 mg/m^3 and the NIOSH REL for zinc oxide dust is 5 mg/m^3 with a STEL of 15 mg/m^3.
***The OSHA PEL for iron oxide fume is 10 mg/m^3. The ACGIH TLV and the NIOSH REL for iron oxide dust and fume is 5 mg/m^3.

European Economic Community (EEC) Classification: Lead: Lead compounds are classified as Category 1 and Category 3 reproductive toxins and as harmful.

EEC R Phrase(s): Lead Compounds: R61 - may cause harm to unborn child; R62 - possible risk of impaired fertility; R20/22 - harmful by inhalation and if swallowed; R33 - danger of cumulative effects.

Trade Names and Synonyms: None

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: Dark brown talc-like substance. Caution! The toxicological properties of this substance have not been fully investigated. Overexposure may cause eye, skin, digestive tract, and respiratory tract irritation. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies on laboratory animals. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

EYE:
Eye contact may cause eye irritation.

SKIN:
Skin contact may cause skin irritation.

INHALATION:
Dust is irritating to the nose, throat, and respiratory tract. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

INGESTION:
Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. The toxicological properties of this substance have not been fully investigated.

SIGNS AND SYMPTOM OF EXPOSURE:
Lead is a cumulative poison. When significant continuous or periodic exposure occurs, increasing amounts build up in the body and eventually symptoms and disability may occur. Some signs and symptoms of exposure to lead compounds include gastrointestinal discomfort, a blue-black line on the gums, neuromuscular dysfunction including muscle weakness and paralysis, and mental changes.

CHRONIC EFFECTS:
Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies with laboratory animals. The toxicological properties of this substance have not been fully investigated.

REPRODUCTIVE HAZARDS:
Overexposure to lead compounds may cause adverse reproductive effects. Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant.

CARCINOGENICITY INFORMATION:
Lead compounds may cause cancer based on studies with laboratory animals.

TARGET ORGAN:
Target Organs for lead compounds include: the central and peripheral nervous systems, blood-forming organs, kidneys, and the male reproductive system.

SECTION 4. FIRST AID MEASURES

EYE CONTACT FIRST AID: