



GE Betz

GE Betz Canada, Inc.
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Material Safety Data Sheet

Issue Date: 04-MAY-2005

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

STEAMATE NA5640

PRODUCT APPLICATION AREA:

STEAM CONDENSATE TREATMENT

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the WHMIS Regulations is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
108-91-8	CYCLOHEXYLAMINE Flammable; corrosive; toxic (by ingestion and skin absorption) ORAL LD50-RAT: 156 MG/KG DERMAL LD50-RABBIT: 277 MG/KG INHL. LC50-RAT: 8,000 PPM/4HR	15-40
100-37-8	DIETHYLAMINOETHANOL (DEAE) Combustible liquid; corrosive (eyes and skin); irritant (respiratory); absorbed by skin; potential skin sensitizer ORAL LD50-RAT: 1,300 MG/KG DERMAL LD50-RABBIT: 1,260 MG/KG INHL. LC50-MOUSE: 5,000 MG/M3/HR	10-30
110-91-8	MORPHOLINE Flammable liquid; corrosive; toxic (by skin absorption); potential liver and kidney toxin; IARC=3 (carcinogen status not classifiable) ORAL LD50-RAT: 1,050 MG/KG DERMAL LD50-RABBIT: 504 MG/KG INHL. LC50-RAT: 8,000 PPM/8HR	3-7

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HAZARDOUS INGREDIENTS (continued):

No component is considered to be a carcinogen by the U.S. National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) or under WHMIS.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Corrosive to skin. Absorbed by skin. Potential skin sensitizer. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

Odor: Amine; Appearance: Colorless To Light Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide or foam--Avoid water if possible.

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; Toxic; Corrosive to skin. Absorbed by skin. Potential skin sensitizer.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Primary route of exposure; Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

INGESTION EFFECTS:

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

TARGET ORGANS:

Prolonged or repeated exposures may cause CNS depression and/or toxicity to the liver, kidney, and nervous system. May cause tissue necrosis.

MEDICAL CONDITIONS AGGRAVATED:

Asthma, allergies, skin disorders, and chronic respiratory disease.

SYMPTOMS OF EXPOSURE:

Inhalation may cause lightheadedness, slurred speech, nausea, and/or vomiting (pulmonary edema may result). Skin contact can cause severe irritation or burns.

4 FIRST AID MEASURES

SKIN CONTACT:

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide or foam--Avoid water if possible.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

135F 57C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Remove ignition sources. Flush area with water. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

The waste characteristics of the absorbed material, or any contaminated soil, should be determined in accordance with provincial regulations. Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement or discharged under provincial regulations. Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Alkaline. Corrosive(Skin/eyes). Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Keep away from flames or sparks. Bond containers during filling or discharge when performed at temperatures at or above the product flash point.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME**CYCLOHEXYLAMINE**

PEL (OSHA): 10 PPM

TLV (ACGIH): 10 PPM

DIETHYLAMINOETHANOL (DEAE)

PEL (OSHA): 10 PPM(SKIN)

TLV (ACGIH): 2 PPM(SKIN)

MORPHOLINE

PEL (OSHA): 20 PPM-SKIN(30PPM-STEL)

TLV (ACGIH): 20 PPM-SKIN(30PPM-STEL)

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

RESPIRATORY PROTECTION:

If air-purifying respirator use is appropriate, use a respirator with organic vapor cartridges and dust/mist prefilters.

SKIN PROTECTION:

gauntlet-type neoprene gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F,21C)	0.960	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	24	Vapor Density (air=1)	> 1.00
Freeze Point (C)	-4		
Viscosity(cps 70F,21C)	10	% Solubility (water)	100.0

Odor	Amine
Appearance	Colorless To Light Yellow
Physical State	Liquid
Flash Point	P-M(CC) 135F 57C
pH As Is (approx.)	12.5
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with acids.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"C"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: 680 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: 990 mg/kg
NOTE - Estimated value

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Acute Toxicity (Estimated)
LC50= 69; No Effect Level= 30 mg/L
Fathead Minnow 96 Hour Acute Toxicity (Estimated)
LC50= 250; No Effect Level= 110 mg/L

BIODEGRADATION

BOD-28 (mg/g): 126
BOD-5 (mg/g): 1
COD (mg/g): 1041
TOC (mg/g): 250

13 DISPOSAL CONSIDERATIONS

Incinerate or bury in approved landfill. Please be advised that there may be additional local or provincial requirements relating to the disposal of waste. Consult provincial and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

Transportation of Dangerous Goods:

Proper Shipping Name: Amines, Liquid, Corrosive, Flammable, N.O.S.
(Cyclohexylamine)
PIN: UN2734; Classification: 8(3); Packing Group II

15 REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

CEPA:

All components of this product comply with substance notification requirements under CEPA.

WHMIS CLASSIFICATION:

B3 D1B D2B E

FOOD AND DRUG ADMINISTRATION:

ALL ingredients in this product are authorized in 21CFR173.310 for use as boiler water additives where the steam may contact food.

16 OTHER INFORMATION

NFPA/HMIS

Health

3

CODE TRANSLATION

Serious Hazard

Fire	2	Moderate Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	30-JAN-1997		** NEW **
	04-JUN-1997	15	30-JAN-1997
	02-MAY-2000	2	04-JUN-1997
	02-APR-2003		02-MAY-2000
	04-MAY-2005	4	02-APR-2003

Material Safety Data Sheet

Rec'd May 8/06

Product Name SANI HANDS	Code G-533	Date Completed 23-Feb-06
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WHMIS Classification Not Controlled (DIN# 02242309)
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TDG Classification Flammable Liquids, N.O.S.(Isopropyl Alcohol); Class 3; UN 1993; PGII
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HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
Isopropyl Alcohol	60-100	67-63-0	LD50 Oral (rat) 5840mg/Kg LC50 (rat) 12000ppm/8hr.
			Human Lethal Dose=250mL ACGIH TLV -400ppm

PHYSICAL DATA FOR PRODUCT

Physical State Liquid		Vapour Pressure 33 mmHg @20C		Vapour Density 2.07	
pH Neutral			Evaporation Rate 3.0 (Butyl Acetate=1)		
Boiling Point (C) 82.78	Sp. Gravity 0.8613	Freezing Point (C) -27	Solubility in Water 100%		
Appearance and Odour Clear colorless liquid with alcohol odour.					

FIRE AND EXPLOSION DATA FOR PRODUCT**Fire Extinguishing Substances (√)**Water fog CO2

Other

Detail: N/A

 Foam Dry Chem**Reactivity Data For Product****INCOMPATIBILITY (√)**

Other

Detail:

Perchlorates, chlorine and halogen compounds.

Acid Base Water Oxidizing Material

**Hazardous Decomposition Products**

Ethylene oxide, aldehydes and amines. May liberate carbon monoxide or carbon dioxide.

Chemical Stability

Stable

Hazardous Combustion Products

Toxic gases and vapours, such as carbon monoxide and carbon dioxide.

Special Fire Fighting Procedures

Use self contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode. Wear full protective clothing. Do not use a direct water stream.

Flammable Limits in air, % by vol. Non-Flammable:

Upper	12.7	Lower	2	Flash Point (Test Method)	12C Tag Closed Cup
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HEALTH HAZARD INFORMATION FOR PRODUCT**Emergency and First Aid Procedures****Inhalation:** Get fresh air. Get medical help immediately. Administer oxygen if the victims breathing becomes difficult.**Ingestion:** Induce vomiting. Get immediate medical attention.**Eyes:** Wash thoroughly with plenty of water for at least 15 minutes. Get medical attention.**Skin:** Wash thoroughly with water for at least 15 minutes if irritation occurs after product use. Get medical attention if irritation persists after washing.

EFFECTS OF OVEREXPOSURE (ACUTE AND CHRONIC)

- Inhalation :** Symptoms of intoxication by inhalation may include eye, nose and throat irritation, dizziness, headache and sickness. Very high concentration may cause unconsciousness or death.
- Ingestion :** Symptoms may include headaches, nausea, vomiting, stomach cramps, diarrhea and perhaps unconsciousness or death.
- Eyes :** Vapours will cause irritation to eyes. Liquids and mists can cause visual impairment or corneal burns.
- Skin :** Prolonged or repeated contact on sensitive skin may cause dermatitis.
-

PREVENTIVE MEASURES

- Spillage** Notify safety personnel. Remove all sources of ignition. Provide adequate ventilation. Absorb with non-combustible sorbent material. Do not flush to sewer.
- Waste Disposal Method** Follow federal, provincial and local regulations.
- Labeling & Storage Requirements.** Keep away from all sources of ignition and heat. Use adequate ventilation. Keep containers closed.
- Ventilation** Use under well ventilated area to meet TLV requirements.
- Respiratory Protection** Use air supplies or self-contained breathing apparatus when concentration is above TLV.
- Eye Protection** Safety glasses with side-shields.
- Other Protection** Gloves and coveralls may be worn.



GE Betz Canada, Inc.
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Material Safety Data Sheet

Issue Date: 30-JUN-2005

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

REAGENT NAME:

SULFITE INDICATOR, ACID-STARCH

REAGENT CODE:

L6091

REAGENT APPLICATION AREA:

FIELD TEST REAGENT

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the WHMIS Regulations is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
5329-14-6	SULFAMIC ACID (AMIDOSULFONIC ACID) Corrosive (eyes); irritant (skin) ORAL LD50-RAT: 3,160 MG/KG DERMAL LD50: NO DATA. INHL. LC50: NO DATA.	60-100
9005-25-8	STARCH Irritant (respiratory) ORAL LD50: NO DATA. DERMAL LD50: NO DATA. INHL. LC50: NO DATA.	3-7

No component is considered to be a carcinogen by the U.S. National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) or under WHMIS.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

May cause moderate irritation to the skin. Corrosive to the eyes.
Dusts cause irritation to the upper respiratory tract.

Odor: None; Appearance: White, Solid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Dusts cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Inhalation of dusts may cause irritation and/or burns to the respiratory tract. Skin contact can cause moderate irritation to burns (dependent on length of exposure).

4 FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

The waste characteristics of the absorbed material, or any contaminated soil, should be determined in accordance with provincial regulations. Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement or discharged under provincial regulations. Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Corrosive to moist skin. Corrosive to eyes.

STORAGE:

Keep containers closed when not in use. Reasonable and safe chemical storage. Keep dry.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

SULFAMIC ACID (AMIDOSULFONIC ACID) ..

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

STARCH

PEL (OSHA): 5 MG/M3 (RESPIRABLE FRACTION); 15MG/M3 (TOTAL DUST)

TLV (ACGIH): 10 MG/M3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

RESPIRATORY PROTECTION:

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

airtight chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Density	NO DATA	Vapor Pressure (mmHG)	NA
Freeze Point (F)	NA	Vapor Density (air=1)	NA
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	< 5.0
Odor		None.	
Appearance		White	
Physical State		Solid	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		2.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>2,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

No Data Available.

BIODEGRADATION

No Data Available.

13 DISPOSAL CONSIDERATIONS

Incinerate or bury in approved landfill. Please be advised that there may be additional local or provincial requirements relating to the disposal of waste. Consult provincial and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

Transportation of Dangerous Goods:

Proper Shipping Name: Sulphamic Acid

PIN: UN2967; Classification 8; Packing Group III

15 REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

CEPA:

All components of this product comply with substance notification requirements under CEPA.

WHMIS CLASSIFICATION:

D2B E

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	3	Serious Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
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MSDS status:	30-DEC-1996		** NEW **
	12-AUG-1999		30-DEC-1996
	29-JUL-2002	4	12-AUG-1999
	30-JUN-2005	16	29-JUL-2002



GE Betz Canada, Inc.
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 Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 25-JAN-2005

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

SPECTRUS OX1203

PRODUCT APPLICATION AREA:

SOLID MICROBIAL CONTROL AGENT.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the WHMIS Regulations is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
16079-88-2	1-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN Oxidizer; irritant (eyes and skin) ORAL LD50-RAT: 578 MG/KG DERMAL LD50-RABBIT: >2,000 MG/KG INHL. LC50-RAT: 1.88 MG/L/4HR	60-100

No component is considered to be a carcinogen by the U.S. National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) or under WHMIS.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Moderately irritating. May be corrosive in contact with moist skin. Severe irritant to the eyes. Dusts cause irritation to the upper respiratory tract.

Odor: Halogen; Appearance: White, Tablets

Fire fighters should wear positive pressure self-contained breathing

apparatus(full face-piece type). Proper fire-extinguishing media:
Flood with water. Use of CO2 or foam may not be effective.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; Moderately irritating. May be corrosive in contact with moist skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Dusts cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause severe irritation or burning of the gastrointestinal tract.

TARGET ORGANS:

Repeated skin contact may cause sensitization.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin, irritation, and/or tearing of eyes (direct contact).

4 FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

Flood with water. Use of CO2 or foam may not be effective.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Product releases chlorine when wet. Spill residue may be neutralized with 3% hydrogen peroxide solution.

DISPOSAL INSTRUCTIONS:

The waste characteristics of the absorbed material, or any contaminated soil, should be determined in accordance with provincial regulations. Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement or discharged under provincial regulations. Dispose of in approved pesticide facility or according to label instructions.

7 HANDLING & STORAGE

HANDLING:

Oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids.

STORAGE:

Keep containers closed when not in use. Keep dry. Do not store at high temperature or near oxidizables or combustibles.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

1-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

RESPIRATORY PROTECTION:

If air-purifying respirator use is appropriate, use a respirator with acid gas cartridges and dust/mist prefilters.

SKIN PROTECTION:

gauntlet-type neoprene gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

airtight chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Density	60.000 lb/cu.	Vapor Pressure (mmHG)	< 1.0
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	0.2

Odor		Halogen	
Appearance		White	
Physical State		Tablets	
Flash Point	P-M(CC)	> 200F > 93C	
pH 5% Disp. (approx.)		4.7	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

Slowly releases halogen gases when contaminated with moisture. May react with alkalies, acids, organics or reducing agents.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: 578 mg/kg
 NOTE - 600 mg/kg per alt. source; dehalogenated byproduct Rat Oral LD50: >4,000 mg/kg

Teratology RAT:
 NOTE - Dehalogenated byproduct study had terata (secondary) at maternal toxic doses

Reproductive Toxicity RAT: 4,500 mg/kg/day
 NOTE - Dehalogenated byproduct study had no adverse reproductive toxicity

Dermal LD50 RABBIT: >2,000 mg/kg
 NOTE - Alternate source concurs

Inhalation LC50 RAT: 1.88 mg/L/4hr
 NOTE - >3.2 mg/L/4hr at 100 ppm (no deaths) per alternate source

Skin Irritation Score RABBIT: 6.1
 NOTE - 6.98 per alternate source; reversible; dehalogenated byproduct score: 0.8

Eye Irritation Score RABBIT: 103
 NOTE - 14 Day-irreversible-max.at day 3; dehalogenated byproduct score: 12.8-reversible

90 Day Feed Study RAT:
 NOTE - Dehalogenated byproduct 90-day oral LD50: >2,000 mg/kg/day

Skin Sensitization G.PIG: POSITIVE
 NOTE - Buehler Test; dehalogenated byproduct was negative in Buehler Test

Ames Assay BACTERIA: NEGATIVE
 NOTE - +/- Metabolic activation; dehalogenated byproduct: negative

Non-Ames Mutagenicity YEAST: NEGATIVE
 NOTE - Dehalogenated byproduct negative for: Mouse Lymphoma, SCE, Cell transformation

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

American Oyster 96 Hour Static Acute Bioassay
LC50 Greater Than= 640; No Effect Level= 12 mg/L
Daphnia magna 21 Day Chronic Bioassay
Reproduction NOEL= .06 mg/L
Daphnia magna 48 Hour Static Acute Bioassay
LC50= .49; No Effect Level= .32 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay
LC50= 2.43; No Effect Level= 1.83 mg/L
Grass Shrimp (Palaemonetes pugio) 96 Hour Static Acute Bioassay
LC50= 14; No Effect Level= 6.5 mg/L
Rainbow Trout 96 Hour Static Acute Bioassay
LC50= .94; No Effect Level= .54 mg/L
Sheepshead Minnow 96 Hour Static Acute Bioassay
LC50= 21.6; No Effect Level= 12.1 mg/L

BIODEGRADATION

BOD-28 (mg/g): 11
BOD-5 (mg/g): 6
COD (mg/g): 920
TOC (mg/g): 250

13 DISPOSAL CONSIDERATIONS

Incinerate or bury in approved landfill. Please be advised that there may be additional local or provincial requirements relating to the disposal of waste. Consult provincial and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

Transportation of Dangerous Goods:

Proper Shipping Name: Oxidizing Substances, Solid, N.O.S.
(Bromo, Chloro, Dimethyl Hydantoin)
PIN: UN1479; Classification: 5.1(9.2); Packing Group: II

15 REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

CEPA:

All components of this product comply with substance notification requirements under CEPA.

WHMIS CLASSIFICATION:

Not applicable

FOOD AND DRUG ADMINISTRATION:

The ingredients in this product are approved by FDA under 21 CFR 176.300.

PEST CONTROL PRODUCTS ACT:

Registry # 21467

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	1	Slight Hazard

Reactivity	1	Slight Hazard
Special	OXY	DOT or NFPA Oxidizer
(1) Protective Equipment	C	Goggles, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	19-DEC-1997		** NEW **
	09-SEP-1998		19-DEC-1997
	10-SEP-1998		09-SEP-1998
	23-SEP-1999	;EDIT:9	10-SEP-1998
	21-APR-2000	4	23-SEP-1999
	22-SEP-2000	8	21-APR-2000
	06-DEC-2000	12	22-SEP-2000
	03-JAN-2001	15	06-DEC-2000
	22-MAR-2001	15	03-JAN-2001
	18-FEB-2002	3,4	22-MAR-2001
	19-FEB-2002	3,4	18-FEB-2002
	20-FEB-2002	3,4	19-FEB-2002
	25-JAN-2005	16	20-FEB-2002



MATERIAL SAFETY DATA SHEET

Sodium Hypochlorite 5-15%

Section 01 - Chemical And Product And Company Information

Product Identifier Sodium Hypochlorite (5-15%)

Product Use Disinfectant, bleaching agent, source of available chlorine, deodorizer.

Supplier Name ClearTech Industries inc.
2303 Hanselman Avenue
Saskatoon, SK, Canada
S7L 5Z3

Prepared By ClearTech Industries Inc. Technical Department
Phone: (306)664-2522

Preparation Date November 28, 2005

24-Hour Emergency Phone 306-664-2522



Section 02 - Composition / Information on Ingredients

Hazardous Ingredients	Sodium Hypochlorite	5.4-13.2
	Sodium Hydroxide	0.1-0.5
	Sodium Chloride	4-12
CAS Number	Sodium Hypochlorite	7681-52-9
	Sodium Hydroxide	1310-73-2
	Sodium Chloride	7647-14-5
Synonym (s)	Industrial bleach, hypo, bleach, Javel water, household bleach	



Section 03 - Hazard Identification

- Inhalation**..... Irritant of the nose and throat, causing coughing, difficulty breathing, and pulmonary edema.
- Skin Contact / Absorption**..... Causes severe skin irritation with blistering and ulceration.
- Eye Contact**..... Causes severe irritation of the mucous membranes of the eyes. May cause severe eye damage.
- Ingestion**..... Burning of the mouth and throat, abdominal cramps, nausea, vomiting, diarrhea, shock. May lead to convulsions, coma, and even death.
- Exposure Limits**..... None established.
ACGIH/TLV-TWA= 1ppm (chlorine)

Section 04 - First Aid Measures

- Inhalation**..... Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention.
- Skin Contact / Absorption**..... Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.
- Eye Contact**..... Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention.
- Ingestion**..... Do not induce vomiting. If vomiting occurs, lean victim forward to prevent breathing in vomitus. Give large amounts of water. Do not give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.
- Additional Information**..... Not available

Section 05 - Fire Fighting

- Conditions of Flammability**..... Non-flammable
- Means of Extinction**..... Product does not burn. Use appropriate extinguishing media for material that is supplying the fuel to the fire.



- Flash Point..... Not applicable
- Auto-ignition Temperature..... Not applicable
- Upper Flammable Limit Not applicable
- Lower Flammable Limit..... Not applicable
- Hazardous Combustible Products... Decomposition may produce chlorine gas and/or hydrogen chloride gas.
- Special Fire Fighting Procedures.... Wear NIOSH-approved self-contained breathing apparatus and protective clothing.
- Explosion Hazards..... Pressure buildup in containers could result in an explosion when heated or in contact with acidic fumes. Vigorous reaction with oxidizable organic materials may result in a fire.

Section 06 - Accidental Release Measures

- Leak / Spill..... Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Prevent material from entering sewers. Flush with water to remove any residue.
- Deactivating Materials..... Neutralize first with sodium sulphite, sodium metabisulphite or other dechlorination agent for no chlorine residual, then with hydrochloric acid until the pH is 7.

Section 07 - Handling and Storage

- Handling Procedures..... Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
- Storage Requirements..... Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from incompatible materials. Venting of containers is advisable.

Section 08 - Personal Protection and Exposure Controls

Protective Equipment

- Eyes..... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.



- Respiratory**..... A NIOSH-approved respirator suitable for chlorine is recommended. Where a higher level of protection is required, use a self-contained breathing apparatus.
- Gloves**..... Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
- Clothing**..... Body suits, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
- Footwear**..... Impervious boots of chemically resistant material should be worn at all times

Engineering Controls

- Ventilation Requirements**..... Mechanical ventilation (dilution or local exhaust), process or personnel enclosure, and control of process conditions. Supply sufficient replacement air to make up for air removed by exhaust systems.
- Other**..... Emergency shower and eyewash should be in close proximity.

Section 09 - Physical and Chemical Properties

- Physical State**..... Liquid
- Odor and Appearance**..... Strong chlorine odour. Clear, greenish-yellow solution.
- Odor Threshold**..... Not available.
- Specific Gravity (Water=1)**..... 1.17 at 20°C (12% trade)
- Vapor Pressure (mm Hg, 20C)**..... 12.1mm Hg at 20°C (12.5 wt %)
- Vapor Density (Air=1)**..... Not available
- Evaporation Rate**..... Not available
- Boiling Point**..... Slowly decomposes above 40°C.
- Freeze/Melting Point**..... ~ -15°C (12% trade)
- pH**..... < 12



Water/Oil Distribution Coefficient.... Not available
Bulk Density..... Not available
% Volatiles by Volume..... Not available
Solubility in Water..... Complete
Molecular Formula..... NaOCl
Molecular Weight..... 74.44

Section 10 - Stability and Reactivity

Stability..... Unstable at temperatures above 40°C, in sunlight, and in contact with acid.
Incompatibility..... Incompatible with strong acids, ammonia, oxidizable materials, nickel, copper, tin, manganese, and iron.
Hazardous Products of Decomposition.. Chlorine (by reaction with acids), oxygen (by reaction with nickel, copper, tin, manganese, iron), sodium chloride, sodium chlorate, with increased temperature.
Polymerization..... Will not occur

Section 11 - Toxicological Information

Irritancy..... Strong irritant
Sensitization..... Not available
Chronic/Acute Effects..... If over-exposed to the solution, there will be constant irritation of the eyes, nose, and throat.
Synergistic Materials..... Not available
Animal Toxicity Data..... LD₅₀(oral, rat) = 8910mg/kg (100% sodium hypochlorite)
Carcinogenicity..... Not considered to be carcinogenic (IARC and ACGIH).
Reproductive Toxicity..... Not available
Teratogenicity..... Not available



Mutagenicity..... Not available

Section 12 - Ecological Information

Fish Toxicity..... Not available

Biodegradability..... Not available

Environmental Effects..... Not available

Section 13 - Disposal Consideration

Waste Disposal.....Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transportation Information

TDG Classification

Class..... 8

Group..... III

PIN Number..... UN 1791

Other..... Secure containers (full and/or empty) with suitable hold down devises during shipment.

Section 15 - Regulatory Information

WHMIS Classification.....E

NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

NSF Certification.....Product is certified under ANSI/NSF Standard 60 for disinfection and oxidation at a maximum dosage for the following:

- sodium hypochlorite 6%: 175mg/L
- sodium hypochlorite 12%: 87mg/L
- sodium hypochlorite 15%: 70mg/L

Section 16 - Other Information

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions



required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Hanselman Avenue, Saskatoon, SK, S7L 5Z3

Phone: 306-664-2522

Fax: 306-665-6216

www.ClearTech.ca

Location	Address	Postal Code	Phone Number	Fax Number
Richmond, B.C.	12431 Horseshoe way	V7A 4X6	604-272-4000	604-272-4596
Calgary, AB	5516E - 40 th St. S.E.	T2C 2A1	403-279-1096	403-236-0989
Edmonton, AB	11750 - 180 th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon, SK	2302 Hanselman Avenue	S7L 5Z3	306-933-0177	306-933-3282
Regina, SK	555 Henderson Drive	S42 5X2	306-721-7737	306-721-8611
Winnipeg, MB	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga, ON	7480 Bath Road	L4T 1L2	905-612-0566	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522

SECTION 1 - HAZARDOUS INGREDIENTS

<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>LC50, ppm (inhalation, rat)</u>	<u>LD50, mg/kg (Oral, rat)</u>
Tungsten	7440-33-7	98-99	N/Av	2 g/kg (route unknown)
Thorium dioxide	1314-20-1	1-2	N/Av	N/Av

SECTION 2 - PREPARATION INFORMATION

Prepared by: Thermal Dynamics Corporation

Telephone #: 603-298-5711

Preparation date: November 19, 2003

SECTION 3 - PRODUCT IDENTIFICATION

Product identifier: Thoriated Tungsten Electrodes

Product use: electrodes and inserts for electrodes other than air plasma gas

Supplier name and address:

Thermal Dynamics Corporation
82 Benning Street
West Lebanon, New Hampshire 03784
Telephone: 603-298-5711

Manufacturer name and address:

OSRAM Sylvania Inc.
Hawes Street
Towanda, PA 18848-0504
Telephone: 717-268-5000

Emergency Telephone #: CHEMTREC 800 424 9300 USA / CANADA
703 527 3887 INTERNATIONAL

HMIS Rating: Health - 1*; Flammability - 0; Reactivity - 0

SECTION 4 - PHYSICAL DATA

- **Physical state, odor and appearance:** Gray metal solid, no odor.
- **Odor threshold:** N/Av
- **Specific gravity:** 19
- **Coefficient of water/oil distribution:** N/Av
- **Vapor pressure (mm Hg @ 20°C):** N/Av
- **Boiling point:** 5660°C
- **Melting point:** 3410°C (for pure tungsten; melting point of mixture will be lower)
- **pH:** N/Av
- **Vapor density (Air=1.0):** N/Av
- **Evaporation rate (n-BuAc=1.0):** N/Av
- **Volatiles, %:** None
- **Solubility in water (w/w):** Insoluble

SECTION 5 - FIRE AND EXPLOSION DATA

- **Conditions of flammability:** Non-flammable. However, cutting and welding procedures may ignite combustible materials in work area if proper safety precautions are not met.
- **Means of extinction:** None required for product. If involved in fire, use whatever means of extinction available that is appropriate to the type of fire.
- **Sensitivity to mechanical impact/static discharge:** Not susceptible to mechanical impact or static discharge.
- **Flash point (Method):** None
- **Lower/upper flammable limits (% by volume):** N/Ap
- **Auto-ignition temperature:** N/Av
- **Hazardous combustion products:** None known.

SECTION 6 - REACTIVITY DATA

- **Stability:** Stable. Hazardous polymerization will not occur.
- **Incompatible materials:** None known.
- **Conditions of reactivity:** During cutting and welding, harmful products may occur (see below).
- **Hazardous decomposition:** products Fumes (oxides of metal being welded) and gases such as carbon monoxide, ozone and oxides of nitrogen) may be emitted, depending on the process, procedure, and metal being cut or welded. Some loss of metal due to evaporation and/or oxidation does occur.

SECTION 7 - TOXICOLOGICAL PROPERTIES

Routes of exposure and acute/chronic effects

- **Exposure limits:** ACGIH: For tungsten, TWA of 5 mg/m³, Ceiling of 10 mg/m³, as W.
- **Inhalation:** Short-term overexposure to cutting and welding fumes may result in discomfort such as dizziness, nausea and/or irritation of the eyes, nose and throat. Other effects depend on the metal being cut or welded and the work conditions. Plasma electrodes are non-consumable. However, some loss of electrode metal may occur depending on cutting or welding conditions. With the exception of two Russian studies that found early signs of pulmonary fibrosis in some workers exposed to tungsten and tungsten trioxide dust, most studies have shown tungsten to be toxicologically inert. Thorium dioxide is a naturally occurring radioactive element. It is an alpha emitter and, as such, its primary hazard lies in inhalation of dust or fumes. Normal handling of these electrodes are not expected to result in any significant external radiation exposure. Considerable experience in refining and use of thorium dioxide has not revealed any adverse effects from industrial exposure.
- **Skin contact:** Adverse skin reactions from contact with electrodes are unlikely. However, burns may occur from touching hot metal. Radioactive alpha particles normally cannot penetrate the upper layers of skin tissue.
- **Eye contact:** Fumes and/or gases produced during cutting and welding may irritate the eyes. Wear eye protection (see below) to prevent "welder's flash", irritation or burning caused by ultraviolet light damaging eye tissue when the victim looks directly at the arc.
- **Ingestion:** Unlikely to occur.
- **Chronic effects:** No known long-term effects. However, overexposure to any fume or dust may eventually damage the lungs, so reduce exposure as far as possible.
- **Carcinogenicity:** Thorium dioxide has been identified as a carcinogen by IARC. Evidence for its ability to cause cancer has come solely from its internal medical use.

- **Teratogenicity, mutagenicity, other reproductive effects:** Some tests indicate reproductive effects for tungsten.
- **Sensitization to material:** By itself, thorium metal is known to be able to cause dermatitis.
- **Synergistic materials:** None known.

SECTION 8 - FIRST AID

- **Inhalation:** Remove victim to fresh air. If breathing difficulty does not improve rapidly, get patient to a doctor.
- **Skin:** Wash skin with mild soap and water. Rinse thoroughly. See a doctor right away from burns or irritation resulting from the cutting and welding process.
- **Eyes:** If irritation occurs, flush eyes with plenty of water. Get medical attention if irritation persists.
- **Ingestion:** If swallowed, get medical attention.

SECTION 9 - PREVENTIVE MEASURES

- **Spill, leak or release:** Does not normally apply.
- **Waste disposal:** Consult federal, provincial and local for allowed means of disposal.

PROTECTIVE EQUIPMENT

- **Respiratory protection:** Wear a NIOSH-approved respirable fume respirator when welding in confined spaces and whenever fume concentrations exceed applicable limits for thorium, tungsten or other welding fumes.
- **Engineering controls:** Use enough general ventilation and/or local exhaust at the arc to keep the fumes and gases below applicable limits in the worker's breathing zone and the general area. If such equipment is not available, use respirators as specified above.
- **Protective gloves:** Welders' gloves are recommended.
- **Eye protection:** Wear helmet or use face shield with appropriate filter lens. Provide protective screens and flash goggles, if necessary, to shield others.
- **Other protective equipment:** Wear hand and body protection to prevent injury from arc radiation, sparks and electrical shock. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Welders should be trained not to touch live electrical parts and to insulate themselves from work and ground.

STORAGE AND HANDLING

- **Handling procedures and equipment:** Avoid inhaling dusts or fumes. Follow accepted welding safety procedures.
- **Storage requirements:** Store in a cool, dry area.
- **Special shipping information:** None (See Section 10).

SECTION 10 - REGULATION INFORMATION

(Not meant to be all-inclusive - selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown on this page. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, provincial or state, and

local laws. The following specific information is made for the purpose of complying with numerous federal, provincial or state, and local laws and requirements. See MSDS for health and safety information.

Canadian Regulations:

WHMIS INFORMATION: Class D2A (Toxic and Infectious Substances, Other Toxic Effects, Very Toxic Material)

TDG INFORMATION: Not regulated as dangerous goods.

U.S. Regulations:

SARA 313 INFORMATION: This product contains thorium dioxide, which is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment Reauthorization Act of 1986 and 40 CFR Part 372.

Department of Transportation (DOT): Not hazardous according to DOT criteria.

Additional notes or references:

Abbreviations:

ACGIH:	American Conference of Governmental Industrial Hygienists
IARC:	International Agency for Research on Cancer
N/Ap:	Not applicable
N/Av:	Not available
NIOSH:	National Institute for Occupational Safety and Health
TCC:	Tagliabue Closed Cup
WHMIS:	Workplace Hazardous Materials Information System

References:

1. Van Nostrand Reinhold, Dangerous Properties of Industrial Materials, Seventh Edition, N. Irving Sax.
2. Canadian Centre for Occupational Health and Safety. RTECS (Registry of Toxic Effects) and CHEMINFO databases.
3. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2000.
4. International Agency for Research on Cancer Monographs.

Material Safety Data Sheet

Rec'd May 8/06

Product Name TRAC LUBE Q	Code ECT-635	Date Completed 23-Feb-06
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WHMIS Classification B3; D2B
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TDG Classification Not Regulated
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HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
Palmitic Acid	0.5 - 1.5	57-10-3	LD50 Inv. (mouse) 57 mg/kg
Oleic Acid	1 - 5	112-80-1	LD50 Oral (rat) 75 g/kg
Linoleic Acid	.5 - 1.5	60-33-3	LD50 Oral (rat) 10.2 g/kg
Mineral Oil	60-100	N/A	N/A

PHYSICAL DATA FOR PRODUCT

Physical State Liquid	Vapour Pressure N/A		Vapour Density N/A
pH straight -3 (1% Solution - 7.2)		Evaporation Rate N/A	
Boiling Point (C) N/A	Sp. Gravity 0.849	Freezing Point (C) N/A	Solubility in Water N/A
Appearance and Odour Clear with slight odour.			

FIRE AND EXPLOSION DATA FOR PRODUCT**Fire Extinguishing Substances (√)**

Water fog ✓ CO2

✓ Other

Detail: Alcohol Foam

Foam ✓ Dry Chem

Reactivity Data For Product**INCOMPATIBILITY (√)**

Other

Detail:

N/A

Acid Base Water Oxidizing Material

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide.

Chemical Stability

Stable

Hazardous Combustion Products

Will produce carbon oxides.

Special Fire Fighting Procedures

Do not use water to fight fire. Wear self contained breathing equipment

Flammable Limits in air, % by vol. Non-Flammable:

Upper	N/A	Lower	N/A	Flash Point (Test Method)
				62 C (144 F) (T.C.C) ; >93.3 at 1:1 dilution with water

HEALTH HAZARD INFORMATION FOR PRODUCT**Emergency and First Aid Procedures**

Inhalation: Move to fresh air.

Ingestion: Drink 1/2 to 1 glass of water. Do not induce vomiting. Get medical attention.

Eyes: Rinse with water for 15 minutes. Get medical attention.

Skin: Wash off with warm water and soap.

EFFECTS OF OVEREXPOSURE (ACUTE AND CHRONIC)

Inhalation : May cause upper respiratory tract irritation, dizziness, headaches, nausea and vomiting.

Ingestion : May cause nausea, vomiting and diarrhea.

Eyes : May cause persistent irritation.

Skin : May cause irritation if prolonged contact occurs.

PREVENTIVE MEASURES

Spillage For larger spills, contain and pick-up. For small spills, wash area with warm water.

Waste Disposal Method Dispose in accordance with federal, provincial and local regulations.

Handling & Storage Requirements Store in cool, well ventilated area away from strong oxidizers. Keep container closed when not in use.

Ventilation Use with adequate ventilation.

Respiratory Protection Not normally necessary.

Eye Protection Safety glasses with side-shield recommended.

Other Protection Rubber gloves and coveralls should be worn to minimize contact with skin and clothing.



Material Safety Data Sheet

LA2849
UCARTHERM(TM) PM 6195

Product Id: LA2849
Product Name: UCARTHERM(TM) PM 6195
Synonyms: None
Chemical Family: Glycols
Application: Heat transfer fluids

Distributed By:
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC
V6X 1W5

Prepared By: The Safety, Health and Environment Department of Univar Canada Ltd.
Preparation date of MSDS: 01/08/2004
Telephone number of preparer: 1-866-686-4827

24-Hour Emergency Telephone Number (CHEMTREC): (800) 424-9300

HAZARDOUS COMPONENTS

Ingredients	Percentage	LD50s and LC50s Route & Species:
Ethylene Glycol 107-21-1	90-95	Oral LD50 (Rat) 4700 mg/kg Oral LD50 (Mouse) 5500 mg/kg Dermal LD50 (Rabbit) 9530 µL/kg

NON-HAZARDOUS COMPONENTS

Ingredients	Percentage	LD50s and LC50s Route & Species:
Dipotassium phosphate 7758-11-4	1-3	Not available.
Water 7732-18-5	3-5	Not available.

Notes: No additional remark.

Potential Acute Health Effects:

Eye Contact: Liquid, vapor, or mist causes irritation, experienced as stinging, excess blinking and tear production, with excess redness of the conjunctiva.

Skin Contact: No evidence of harmful effects from available information.

Inhalation: May cause irritation of upper respiratory tract. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace, may produce nausea, vomiting, headache, dizziness, and irregular eye movements.

Ingestion: May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, lumbar pain, oliguria, uremia, and central nervous system effects, including irregular eye movements, convulsions and coma. May be fatal if swallowed. Cardiac failure, pulmonary edema, and severe kidney damage may develop. A few reports have been published describing the development of weakness of the facial muscles, diminished hearing and difficulty with swallowing, during the late stages of severe poisoning.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention. Remove contact lenses, if worn.

Skin Contact: Wash with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.

Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

Notes To Physician: It is estimated that the oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenase to various metabolites including glycerolaldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and 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 renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100 - 150 mg/dl and should be achieved by a rapid loading dose and maintained by intravenous infusion. 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 ethylene glycol concentration greater than 25 mg/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use in 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and the 15 mg/kg every 12 hours until the ethylene glycol concentrations are below 20 mg/100ml. Slow intravenous infusion is required. Since 4-methylpyrazole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

Flash Point: 115 °C / 239 °F

Flash Point Method: Pensky-Martens Closed Cup

Autoignition Temperature: 398 °C / 748 °F

Flammable Limits in Air (%): Lower:3.2 Upper:15 (Ethylene Glycol)

Extinguishing Media: Extinguish fires with water spray or 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.
Special Exposure Hazards: Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.

NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 1, FLAMMABILITY 1, REACTIVITY 0

HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 1, FLAMMABILITY 1, REACTIVITY 0

Personal Precautionary Measures: Wear appropriate protective equipment.

Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed.

Procedure for Clean Up: Absorb with an inert dry material and place in an appropriate waste disposal container. Large spills or leaks should be confined by diking.

Handling: Do not swallow. Avoid contact with eyes. Avoid breathing aerosols. Avoid breathing vapor. Keep the containers closed when not in use. Use with adequate ventilation. Wash thoroughly after handling. The maximum recommended temperature on the Heat Transfer Fluid side of a heat exchanger is 160 C. If the fluid is exposed to excessively high temperatures, thermal degradation can occur; organic acids and other irritating fumes could result. Respiratory protection, such as an air supplied mask, may be needed until the fumes can be removed.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Store in accordance with good industrial practices.

Engineering Controls: General (mechanical) room ventilation may be adequate, if handled at ambient temperatures or in covered equipment. If ambient temperatures are exceeded or operations exist which may produce mist, aerosol or vapor, local exhaust ventilation or other engineering controls may be required. **PROCESS HAZARD:** Sudden release of hot organic chemical vapor or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition temperature" values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperatures processes should be thoroughly evaluated to establish and maintain safe operating conditions.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. NIOSH-approved atmosphere-supplying respirator or a NIOSH-approved air-purifying respirator with organic vapor cartridge and dust/mist pre-filter is recommended.

Gloves: Neoprene gloves. Nitrile gloves. Polyvinylchloride gloves. Butyl rubber gloves.

Skin Protection: As a minimum, wear long-sleeve shirts, trousers, and gloves for routine produce use.

Eyes: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes.

Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Percentage	Exposure Limit - ACGIH	Exposure Limit - OSHA
Ethylene Glycol	90-95	100mg/m ³ Ceiling	125 mg/m ³ Ceiling 50 ppm Ceiling
Dipotassium phosphate	1-3	Not available.	Not available.
Water	3-5	Not available.	Not available.

Physical State: Liquid

Color: Colourless

Odor: Mild.

pH: Not Available.

Specific Gravity: 1.133

Boiling Point: 163 °C / 325 °F

Freezing/Melting Point: -24 °C / -12 °F

Vapor Pressure: 2.2 mmHg

Vapor Density: 2.1

% Volatile by Volume: 96 Wt%

Evaporation Rate: 0.1

Solubility: 100%

VOCs (lbs/gallon): Not Available.

Viscosity: Not Available.

Molecular Weight: Not Available.

Chemical Stability: Stable.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: None known.

Materials to Avoid: Strong oxidizing agents. Strong acids. Materials reactive with hydroxyl compounds. Strong acids and bases.

Hazardous Decomposition Products: Carbon monoxide. Carbon dioxide.

Additional Information: Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures.

Principle Routes of Exposure

Ingestion: May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, lumbar pain, oliguria, uremia, and central nervous system effects, including irregular eye movements, convulsions and coma. May be fatal if swallowed. Cardiac failure, pulmonary edema, and severe kidney damage may develop. A few reports have been published describing the development of weakness of the facial muscles, diminished hearing and difficulty with swallowing, during the late stages of severe poisoning.

Skin Contact: No evidence of harmful effects from available information.

Inhalation: May cause irritation of upper respiratory tract. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace, may produce nausea, vomiting, headache, dizziness, and irregular eye movements.

Eye Contact: Liquid, vapor, or mist causes irritation, experienced as stinging, excess blinking and tear production, with excess redness of the conjunctiva.

Additional Information:

Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material. May aggravate an existing kidney disease. Repeated inhalation of ethylene glycol mist may produce signs of central nervous system involvement, particularly dizziness and nystagmus.

Acute Test of Product:

Acute Oral LD50: Peroral LD50 8200 mg/kg (Rat)

Acute Dermal LD50: Percutaneous LD50 >2000 mg/kg (Rabbit)

Acute Inhalation LC50: Not Available.

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Ethylene Glycol	Not listed.	A4 - Not Classifiable as a Human Carcinogen (aerosol)
Dipotassium phosphate	Not listed.	Not listed.
Water	Not listed.	Not listed.

Carcinogenicity Comment: No additional information available.

Genotoxicity: Not Available.

Reproductive/Developmental Toxicity: Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Specifically, growth retardation and decreased litter size in rats and mice and decreased mating frequency in mice were observed.

Teratogenicity: Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects.

Embryotoxicity: A three generation study indicated that ethylene glycol did not affect reproductive parameters at dietary concentrations up to 1.0 gm/kg/day in any generation.

Mutagenicity: Not Available.

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Ethylene Glycol	LC50 (bluegill) 27500 mg/L LC50 (goldfish) 27500 mg/L LC50 (rainbow trout) 41000 mg/L	Not Available.	Not Available.
Dipotassium phosphate	Not Available.	Not Available.	Not Available.
Water	Not Available.	Not Available.	Not Available.

Other Information: May be harmful to aquatic life.

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.

Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

DOT (U.S.):

DOT Shipping Name: Not Regulated.

DOT Hazardous Class: Not Applicable.

DOT UN Number: Not Applicable.

DOT Packing Group: Not Applicable.

DOT Reportable Quantity (lbs): Not Applicable.

Marine Pollutant: No.

ICAO/IATA:

IATA Proper Shipping Name: Not Regulated.

IATA Hazard Class: Not Applicable.

UN Number: Not Applicable.

Packing Group: Not Applicable.

IATA Label: Not Applicable.

Remarks: No additional remark.

IMDG:

IMDG Proper Shipping Name: Not Regulated.

Hazard Class: Not Applicable.

UN Number: Not Applicable.

Packing Group: Not Applicable.

Marine Pollutant: No.

IMDG Label: Not Applicable.

Remarks: No additional remark.

TDG (Canada):

TDG Proper Shipping Name: Not Regulated.

Hazard Class: Not Applicable.

UN Number: Not Applicable.

Packing Group: Not Applicable.

Note: No additional remark.

Marine Pollutant: No.



U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL) or the Non-Domestic Substances List (NDSL) or exempt.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Ethylene Glycol	Not Listed.	LISTED	LISTED
Dipotassium phosphate	Not Listed.	Not Listed.	Not Listed.
Water	Not Listed.	Not Listed.	Not Listed.

California Proposition 65: Not Listed.

MA Right to Know List: Listed.

New Jersey Right-to-Know List: Listed.

Pennsylvania Right to Know List: Listed.

WHMIS Hazardous Class:

D2A VERY TOXIC MATERIALS

D2B TOXIC MATERIALS



Additional Information:

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer:

NOTICE TO READER:

Univar, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

**MATERIAL SAFETY DATA SHEET**

Date Prepared: February 08, 2003
Supersedes: August 14, 1998
MSDS Number: 8369

1. PRODUCT INFORMATION

Product Identifier: UNIREX N 2 GREASE

Application and Use:
Lubricating grease

Product Description:

A grease, a mixture of lubricating oil, soap and additives.

REGULATORY CLASSIFICATION

WHMIS:

Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):

Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
240 4th Avenue S.W.
Calgary, Alberta
T2P 3M9

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: 0.930 at 15.0 deg C
Viscosity: >20.00 cSt at 40 deg C
Vapour Density: > 5
Boiling Point: 388 deg C
Evaporation rate: <0.01 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: 304 deg C DROP
Odour Threshold: not available
Vapour Pressure: <0.01 kPa at 0 deg C
Appearance/odour: Dark green paste, petroleum odour.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.
High pressure greasing equipment is capable of injecting grease under the skin which may have severe health consequences.

INGESTION:

Low toxicity.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products,

the acute toxicity of this product is expected to be:

Oral : LD50 > 5000 mg/kg (Rat)
Dermal : LD50 > 3160 mg/kg (Rabbit)
Inhalation : LC50 > 5000 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:

For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In case of adverse exposure to vapours, mists and/or fumes formed at elevated temperature, or by mechanical action, immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available. Remove severely contaminated clothing (including shoes) and launder before reuse. If irritation persists, seek medical attention. Consult a physician immediately if the material is injected under the skin from the misuse of high pressure greasing equipment.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use. In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves. Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. In keeping with good personal hygiene practices, wash hands thoroughly after handling the material. Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Allow material to solidify and scrape up. Place material in suitable containers for recycle or disposal. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 246 deg C CQC ASTM D92

Autoignition: > 260 deg C Flammable Limits: LEL: 0.9% UEL: 7.0%

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.

Decomposes; flammable/toxic gases will form at elevated temperatures (thermal decomposition).

Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire.

Use foam, dry chemical or water spray to extinguish fire.

Respiratory and eye protection required for fire fighting personnel.

Avoid spraying water directly into storage containers due to danger of boilover.

A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

See: Hazardous Decomposition

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

HAZARDOUS DECOMPOSITION:

Smoke, oxides of sulphur and nitrogen, and carbon monoxide in the event of incomplete combustion.

Various metal oxides

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

10. PREPARATION

Date Prepared: February 08, 2003
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
240 4th Avenue S.W..
Calgary, Alberta
T2P 3M9
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

Material Safety Data Sheet

Epsilon Chemicals Ltd.
1926-94 STREET NW
Edmonton, AB. T6N 1J3

Phone: 780-438-3047
In Case of Emergency Only
Phone CANUTEC: 613-996-6666

Product Name <b style="text-align: center;">ULTIMATE	Code <b style="text-align: center;">ECT-779	Date Completed <b style="text-align: center;">Thursday, November 27, 2003
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WHMIS Classification <b style="text-align: center;">E: D2B

TDG Classification <b style="text-align: center;">Sodium hydroxide solution: Class 8: UN 1824: PG II

HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
Potassium Hydroxide (45% Sol.)	7-13	1310-58-3	LD50 oral (rat) 365 mg/kg ACGIH TLV - 2 mg/m3
Sodium Hydroxide (50%)	7-13	1310-73-2	LD50 Oral(rabbit) 500mg/Kg ACGIH TLV 2mg/m3
Sodium Hypochlorite	1-5	7681-52-9	LD50 oral (rat) 12 mg/kg

PHYSICAL DATA FOR PRODUCT			
Physical State <b style="text-align: center;">Liquid	Sp. Gravity <b style="text-align: center;">1.172	Solubility in Water <b style="text-align: center;">100%	Vapour Density <b style="text-align: center;">Not available
Vapour Pressure <b style="text-align: center;">Not available	Boiling Point (C) <b style="text-align: center;">Not available	Evaporation Rate <b style="text-align: center;">Not available	Freezing Point (C) <b style="text-align: center;">0
pH <b style="text-align: center;">Highly alkaline	Appearance and Odour <b style="text-align: center;">Pale yellow liquid with chlorine odour		

Fire and Explosion Data for Product		Flammable Limits in air, % by vol. Non-Flammable:	
Flash Point (Test Method) <b style="text-align: center;">N/A	Upper <b style="text-align: center;">N/A	Lower <b style="text-align: center;">N/A	
Fire Extinguishing Substances (-)	<input checked="" type="checkbox"/> Water fog <input type="checkbox"/> Foam	<input type="checkbox"/> CO2 <input type="checkbox"/> Dry Chem	Other <input type="checkbox"/> Detail:
Hazardous Combustion Products Chlorine, oxygen, potassium oxides, and phosphorous oxides.	Special Fire Fighting Procedures As for surrounding fire. Use full protective clothing.		

Reactivity Data for Product		<input checked="" type="checkbox"/> Acid	<input checked="" type="checkbox"/> Other <input type="checkbox"/> Detail:
INCOMPATIBILITY (v)	<input checked="" type="checkbox"/> Water	<input checked="" type="checkbox"/> Oxidizing Material	<input type="checkbox"/> Base
Hazardous Decomposition Products: Hydrogen (from aluminium and other metals mentioned above) chlorine and oxygen	Chemical Stability: Chlorine content decreases with heat, light, decrease in pH and contamination with heavy metals.		

MATERIAL SAFETY DATA SHEET - Page 2

Product Name: **ULTIMATE**

Code: **ECT-779**

HEALTH HAZARD INFORMATION FOR PRODUCT

Emergency and First Aid Procedures

Inhalation: Remove to fresh air. Get medical attention.

Ingestion: Get medical help immediately. Rinse mouth well with water and give patient large quantities of water or milk to drink to dilute the chemical. Do not induce vomiting.

Eyes: Flush with plenty of water for at least 20 minutes. Get medical attention.

Skin: Remove contaminated clothing immediately and flush with water for at least 15 minutes. Get medical help. No oil or ointment should be applied.

Effects of Overexposure (Acute and Chronic)

Inhalation: Irritation of respiratory tract, inflammation of the lungs.

Ingestion: Burning in mouth and esophagus, nausea, vomiting, abdominal pain and diarrhea. Perforation of gastrointestinal tract may occur.

Eyes: Causes severe irritation to the mucous membranes of the eyes. May cause ulceration of the eye.

Skin: Severe irritation and burns to the skin.

PREVENTIVE MEASURES

Spillage: With large spills dyke for later disposal. Neutralize with sodium sulphite then with diluted acid - like hydrochloric or sulphuric acid. Minor spills can be neutralized and flushed with plenty of water.

Waste Dis. Method: Waste product should not be discharged into sewers or streams. It should be first neutralized and then discharged according to federal, local and provincial regulations.

Hand. & Stor. Require: Keep container closed when not in use. Store in cool, dark place away from any possible contaminants.

Ventilation: Use with adequate ventilation.

Resp. Protection: Not normally necessary unless product is misted.

Eye Protection: Chemical workers goggles.

Other Protection: Rubber, nitrile or neoprene gloves and coveralls should be worn.

Prepared by: Technical Service Department, Epsilon Chemicals Ltd. Phone (780) - 438-3040



Imperial Oil

Material Safety Data Sheets

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Date Prepared: July 28, 2004
Supersedes: July 20, 2004
OSDS Number: 00074

1. PRODUCT INFORMATION

Product Identifier: VASOL 3130 SOLVENT

Application and Use:
Solvent, diluent, chemical feedstock or fuel.

Product Description:
aromatic hydrocarbon.

Gas number: 0052-41-3

REGULATORY CLASSIFICATION

WHMIS Information:
Class B, Division 3: Combustible Liquids

TDG Information (Rail/Pool):
PIN Number: UN 1168
Shipping Name: PETROLEUM DISTILLATES, N.O.S.
Packing Group: III
Primary I.D.G. Class 3

Canadian Environmental Protection Act (CEPA):
All components of this product are either on the Domestic Substances
List (DSL) or exempt.

EMERGENCY TELEPHONE NUMBER
Health/Transportation:

24 Hour Service (519) 339-2145

MANUFACTURER/SUPPLIER

Imperial Oil
Chemicals Division
111 St. Clair Avenue West
Toronto, Ontario, M5W 1K3

2. REGULATED COMPONENTS

The following component data is defined in accordance with sub-paragraph
14(3)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act.

MSDS	Conc. (w/v)	CAS	
Standard solvent	100	8652-41-3	LD50: >5 g/kg orl rat LC50: >5 g/m3 rat

3. TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
 Spec. Gravity: 0.79 at 15.5 deg C
 Vap. Pres.: 0.3 kPa at 20 deg C Approximate
 0.9 kPa at 38 deg C Approximate
 Solubility in Water: < 0.01% at 25 deg C
 Boiling Point: 158 to 195 deg C Typical
 Freezing/Melting Point.: -58 deg C
 Viscosity: 1.14 cSt at 25 deg C
 Vapour Density (air=1): 5
 Evaporation Rate, n-Butyl Acetate=1: 0.1 Approximately
 Volatile: 100
 Odor: Not applicable.
 Odour: Mild petroleum odor.
 Appearance: Clear, colorless liquid.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

High vapour/aerosol concentrations (attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
 Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
 Skin contact may aggravate an existing dermatitis condition.

INGESTION:

Minimal toxicity.
 Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause mild to severe pulmonary injury and possibly death.

CHRONIC:

This product contains ethylbenzene. The International Agency for Research on Cancer has evaluated ethylbenzene and classified it as a possible human carcinogen (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. This product contains naphthalene. The International Agency for Research on Cancer evaluated naphthalene and concluded that there was sufficient

children for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Accordingly, IARC classified naphthalene as a possible human carcinogen (Group 2B). High exposures to naphthalene in some animal studies have been reported to cause health effects on the developing embryo/fetus. These effects were often at levels toxic to the mother. The significance of these findings to humans has not been determined.

SPECIAL HEALTH PRECAUTIONS:

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

OCCUPATIONAL EXPOSURE LIMIT

ACGIH RECOMMENDS:

For Toluene, 25 ppm (123 mg/m³).
For Stoddard Solvent, 100 ppm (525 mg/m³).
For Xylene, 100 ppm (404 mg/m³).
For Ethyl Benzene, 100 ppm (484 mg/m³).
For Naphthalene, skin, 10 ppm (52 mg/m³).

MANUFACTURER RECOMMENDS:

a TWA of 900 mg/m³ (75 ppm) based on total hydrocarbon.
Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies depending upon conditions of use.

Where prolonged and/or repeated skin and eye contact is likely to occur, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.

Where eye contact is unlikely, but may occur as a result of short and/or

and other exposures, wear safety glasses with side shields. Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a lab hood. Provide mechanical ventilation of confined spaces.

ELECTROSTATIC ACCUMULATION HAZARD:

Yes, use proper ground procedure.

Additional information regarding safe handling of products with static accumulation potential can be ordered by contacting the American Petroleum Institute (API) for API Recommended Practice 2003, entitled "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents" (American Petroleum Institute, 1220 L Street Northwest, Washington, DC 20002), or the National Fire Protection Association (NFPA) for NFPA 77 entitled "Static Electricity" (National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101).

HANDLING, STORAGE AND SHIPPING:

Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials.

DO NOT handle or store near an open flame, heat, or other sources of ignition. Protect material from direct sunlight.

Material will accumulate static charges which may cause an electrical spark (ignition source). Use proper grounding procedures.

DO NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. DO NOT reuse empty containers without commercial cleaning or reconditioning.

SPILL CONTROL AND DISPOSAL:

Consult an expert on the disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.

Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.

Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.

WATER SPILL:

Eliminate sources of ignition. Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.

Recover from surface with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.

7. FIRE AND EXPLOSION HAZARD

Flash Point and Boiling:
42 deg C (108 / 518 DF° Typical)
Autoignition Temperature: 229 deg C Approximate
Flammable Limits: 1 to 11.7 % by volume Approximate

GENERAL HAZARDS:

Combustible liquid; may form combustible mixtures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) is recommended for indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA is optional.
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

HAZARDOUS COMBUSTION PRODUCTS:

Flames, smoke and carbon monoxide

8. REACTIVITY DATA

GENERAL:

This product is stable and hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

strong oxidizing agents

HAZARDOUS DECOMPOSITION:

Not applicable

9. NOTES

In containers of 454 litres capacity or less this product is exempt from TDG regulations.

REVISION SUMMARY:

Since July 20, 2004 this MSDS has been revised in Section(s):

4

10. PREPARATION

DATE PREPARED: JUL 20, 2004

DATE REEVALUATED: JUL 20, 2004

Prepared By: Solvents

(416) 968-4415

CAUTION: The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information can not be relied upon as complete or applicable. For greater certainty, uses other than those described in "Application and Use" of section 1 must be reviewed with the supplier. The information contained herein is based on information available at the indicated date of preparation.

Call our toll-free customer service center at 1-800-667-ESSO (3776) for information or questions about Material Safety Sheets.

TECHNICAL DATA

WR DEGREASER

Premium Cleaner and Degreaser

DESCRIPTION

WR Degreaser is a highly concentrated combination of heavy-duty detergents. This alkaline cleaner is very effective in removing animal fat, grease, protein soils as well as oil, dirt, wax and other foreign matter. **WR Degreaser** employs "**compressed foam technology**" or **CFT**. The main advantage of **CFT** is that a blanket of chemical is produced in close proximity to the surface to be cleaned. This results in a greater adhesion by maintaining a layer of detergent on the surface for a longer period of time. The result is more effective removal of food soils and allows for better chemical economy. The soil and detergent are easily and rapidly removed with a pressure warm water rinse, leaving the surface clean and shiny. **WR Degreaser** is completely biodegradable. It can be used with hot or cold, hard or soft water.

DIRECTIONS

This product is very effective when used through central, portable or wall mounted **foaming or spraying stations**. For removal of red meat, poultry and fish oils use 25 ml/L of water (4 oz/gal). Allow for contact time of 10 - 15 minutes, and then rinse with potable water.

FOOD PROCESSING

WR Degreaser rapidly emulsifies and disperses all types of animal and vegetable oils and greases. It is free rinsing and leaves stainless steel equipment clean and bright.

PRECAUTIONS

Do not take internally. Avoid contact with eyes and prolonged contact with the skin.

CONTAINS

Potassium Hydroxide, Water Conditioners and Surfactant.

FOR FOOD PLANT AND INDUSTRIAL USE ONLY



E-Chem

Epsilon Chemicals Ltd.

1926-94 Street, Edmonton, Alberta. T6N 1J3. 1-800-361-6348

www.epsilonchemicals.com

9/22/05

Epsilon Chemicals Ltd.
 1926-94 STREET NW
 Edmonton, AB. T6N 1J3

Material Safety Data Sheet

Phone: 780-438-3040
 In Case of Emergency Only:
 Phone CANUTEC: 613-996-6666

Product Name WR DEGREASER	Code ECT-500	Date Completed 23-Feb-06
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WHMIS Classification E:D2B

TDG Classification Potassium Hydroxide Solution; Class 8; UN 1814; PG II
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HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
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Potassium Hydroxide (45% Sol.)	7-13	1310-58-3	LD50 Oral (rat) 365 mg/kg ACGIH TLV - 2 mg/m3
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PHYSICAL DATA FOR PRODUCT

Physical State Liquid	Vapour Pressure N/A		Vapour Density N/A
pH Strong Base		Evaporation Rate N/A	
Boiling Point (C) N/A	Sp. Gravity 1.0875	Freezing Point (C) 0	Solubility in Water 100%
Appearance and Odour Clear liquid with no odour.			

FIRE AND EXPLOSION DATA FOR PRODUCT**Fire Extinguishing Substances (√)**

✓ Water fog CO2

Foam Dry Chem

Other

Detail: N/A

Reactivity Data For Product**INCOMPATIBILITY (√)**

Acid Base Water Oxidizing Material



Other



Detail:

Chlorinated hydrocarbons.

Hazardous Decomposition Products

Carbon dioxide, carbon monoxide are produced on thermal decomposition.

Chemical Stability

Stable.

Hazardous Combustion Products

Carbon oxides and oxides of phosphorous.

Special Fire Fighting Procedures

As for surrounding fire. Wear full protective clothing.

Flammable Limits in air, % by vol. Non-Flammable:

Upper

N/A

Lower

N/A

Flash Point (Test Method)

N/A

HEALTH HAZARD INFORMATION FOR PRODUCT**Emergency and First Aid Procedures****Inhalation:** Remove to fresh air and get medical attention.**Ingestion:** Rinse mouth well with water. Drink large quantities of water or milk. Do not induce vomiting. Get immediate medical attention.**Eyes:** Flush with plenty of water for 15 minutes. Use eye irrigation fountain if available. Get medical attention.**Skin:** Remove contaminated clothing and flush skin with water. Get medical help.

EFFECTS OF OVEREXPOSURE (ACUTE AND CHRONIC)

Inhalation : May cause irritation of respiratory tract.

Ingestion : Burning in mouth and esophagus: nausea, vomiting, abdominal pain and diarrhea.

Eyes : Causes severe irritation to eyes.

Skin : Causes irritation. May cause burns.

PREVENTIVE MEASURES

Spillage Do not let chemical enter sewers or waterways. With large spills, dyke for later disposal. Neutralize minor spills with dilute acid (hydrochloric or sulphuric) before washing away with plenty of water.

Waste Disposal Method Neutralize the waste with acid and bury in a secured sanitary landfill. Follow local, provincial and federal regulations.

Hand. & Stor. Requir. Store in cool, dry area above freezing temperature.

Ventilation Use under well ventilated area.

Resp. Protection Not normally required in well ventilated areas. Use approved respiratory protection if product is misted.

Eye Protection Safety glasses with side-shield.

Other Protection Rubber gloves and boots should be worn.
