Section 9. Physical and chemical properties

Physical state	: Liquid. (Liquid.)
Colour	: Brown.
Odour	: Faint odour.
pH	: 1 (100%)
Boiling/condensation point	: Not available.
Melting/freezing point	: Not available.
Specific gravity	: 1.207 (Water = 1)
Vapour pressure	: Not applicable.
Vapour density	: Not available.
Odour threshold	: Not available.
Evaporation rate	: Not available.
$LogK_{ow}$	: Not available.

Section 10. Stability and reactivity

Stability	: The product is stable.
Conditions of instability	: Not available.
Reactivity	: Highly reactive with alkalis. Reactive with metals. Slightly reactive to reactive with organic materials. Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Incompatibility with various substances	: Not available.
Hazardous Decomposition Products	: Not available.

Section 11. Toxicological information

Potential acute health effects

Eyes	: Corrosive to eyes.
Skin	: Corrosive to the skin.
Inhalation	: Corrosive to the respiratory system.
Ingestion	: Harmful if swallowed. Causes burns to mouth, throat and stomach.
Irritancy of Product	: Hazardous by WHMIS criteria.

Potential chronic health effects

Carcinogenic effects	: No known significant effects or critical hazards.
Mutagenic effects	: No known significant effects or critical hazards.
Teratogenic effects	: No known significant effects or critical hazards.
Reproductive effects	: No known significant effects or critical hazards.
Sensitization to Product	: No known significant effects or critical hazards.
Synergistic products (toxicologically)	: Not available.

Toxicity data

Ingredient name	Test	Result	Route	Species
phosphoric acid	LD50	1530 mg/kg	Oral	Rat
	LD50	2740 mg/kg	Dermal	Rabbit

Target organs : Contains material which causes damage to the following organs: lungs, upper respiratory tract, skin, eye, lens or cornea.

Section 12. Ecological information

Products of degradation : These products are phosphates.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Additional information
TDG Classification	UN1805	PHOSPHORIC ACID, LIQUID	8	III	-

APPLIES ONLY DURING ROAD TRANSPORT

Any variation of the shipping description based on the packaging is not addressed.

Section 15. Regulatory information

WHMIS : Class E: Corrosive material.

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

Section 16. Other information

Date of issue : **07-March-2006.**

Responsible name : **Regulatory Affairs**

Date of previous issue : **15-September-2005.**

Notice to reader

The above information is believed to be correct with respect to the formula used to manufacture the product in the country of origin. As data, standards, and regulations change, and conditions of use and handling are beyond our control, NO WARRANTY, EXPRESS OR IMPLIED, IS MADE AS TO THE COMPLETENESS OR CONTINUING ACCURACY OF THIS INFORMATION.

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

Rec'd May 8/06

Product Name	Code	Date Completed
MAVERICK	ECT-930	23-Feb-06

WHMIS Classification
Not controlled

TDG Classification
Not regulated

HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
Dodecylbenezene sulfonic acid	5-15	27176-87-0	N/A

PHYSICAL DATA FOR PRODUCT

Physical State	Vapour Pressure	Vapour Density
Liquid	N/A	N/A

pH	Evaporation Rate
Neutral	N/A

Boiling Point (C)	Sp. Gravity	Freezing Point (C)	Solubility in Water
N/A	1.0352	N/A	100%

Appearance and Odour
An orange viscous liquid.

FIRE AND EXPLOSION DATA FOR PRODUCT

Fire Extinguishing Substances (√)

Water fog	✔ CO2	Other	**Detail:** N/A
✔ Foam	✔ Dry Chem		

Reactivity Data For Product

INCOMPATIBILITY (√)

Acid	Base	Water	Oxidizing Material	Other	Detail:
☐	☐	☐	☑	☐	N/A

Hazardous Decomposition Products	Chemical Stability
Carbon monoxide, carbon dioxide.	Stable

Hazardous Combustion Products
Will produce carbon oxides.

Special Fire Fighting Procedures
As for surrounding fire.

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

Upper	Lower	Flash Point (Test Method)
N/A	N/A	**Non-flammable**

HEALTH HAZARD INFORMATION FOR PRODUCT

Emergency and First Aid Procedures

Inhalation: N/A

Ingestion: Induce vomiting, drink large quantities of milk or water. Get medical attention.

Eyes: Rinse with plenty of water for 15 minutes.

Skin: Rinse with water.

EFFECTS OF OVEREXPOSURE (ACUTE AND CHRONIC)

Inhalation : No effect.

Ingestion : May cause nausea, vomiting and diarrhea.

Eyes : Causes temporary discomfort and redness.

Skin : May cause mild irritation and defatting of tissue on prolonged contact.

PREVENTIVE MEASURES

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

Waste Dip.Method Dispose in accordance with federal, provincial and local regulations in designated landfill site.

Hnd. & Stor. Requir. Store in cool, well ventilated area away from strong oxidizers. Keep container closed when not in use.

Ventilation General ventilation is sufficient.

Resp. Protection Not normally necessary.

Eye Protection Not normally necessary

Other Protection Not normally necessary. Rubber or plastic gloves may be worn to minimize prolonged contact with skin.

GE Betz

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 11-MAY-2006

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

1 PRODUCT IDENTIFICATION

REAGENT NAME:

MOLYBDOVANADATE REAGENT F/ ORTHO-PO4

REAGENT CODE:

L2326

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%)
7664-93-9	SULFURIC ACID Corrosive ORAL LD50-RAT: 2,140 MG/KG DERMAL LD50: NO DATA. INHL. LC50-RAT: 510 MG/M3/2HR	40-70
12027-67-7	MOLYBDATE HEXAAMMONIUM Potential irritant (eyes and skin); potential lung toxicity ORAL LD50-RAT: 333 MG/KG 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

Corrosive to skin. Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

Odor: None; Appearance: Yellow To Green, Liquid

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; Corrosive to skin.

ACUTE EYE EFFECTS:
Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:
Mists/aerosols cause irritation to the upper respiratory tract.

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 tissue necrosis and/or toxicity to the lung.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Causes severe irritation, burns or tissue ulceration with subsequent scarring.

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, 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:

Acidic. Corrosive(Skin/eyes). Do not mix with alkaline material.

STORAGE:

Keep containers closed when not in use. Store between 40-100F (5-38C). Store away from oxidizers.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

SULFURIC ACID
PEL (OSHA): 1 MG/M3
TLV (ACGIH): 0.2 MG/M3

MOLYBDATE HEXAAMMONIUM
PEL (OSHA): 5 MG/M3 (AS Mo)
TLV (ACGIH): 5 MG/M3 (AS Mo) RESPIRABLE FRACTION

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:

gauntlet-type rubber 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)	1.375	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	ND	Vapor Density (air=1)	< 1.00
Freeze Point (C)	ND		
Viscosity(cps 70F,21C)	4	% Solubility (water)	100.0

Odor		None
Appearance		Yellow To Green
Physical State		Liquid
Flash Point	P-M(CC)	> 200F > 93C
pH 5% Sol. (approx.)		1.0
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 bases or strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"C"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>2,140 mg/kg
NOTE - Value for 100% neat material	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	
Skin Irritation Score RABBIT:	CORROSIVE
NOTE - Based on testing of similar product	
Eye Irritation Score RABBIT:	CORROSIVE
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: Sulphuric Acid
PIN: UN1830; Classification: 8(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:

D2B E

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	3	Serious Hazard
Fire	0	Minimal 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:	17-JUN-1997		** NEW **
	05-JAN-1999	10	17-JUN-1997
	16-MAY-2001	15	05-JAN-1999
	17-MAY-2001	8	16-MAY-2001
	16-NOV-2001	3,4,15,16	17-MAY-2001
	29-OCT-2004	16	16-NOV-2001
	11-MAY-2006	8	29-OCT-2004

GE Betz

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 07-MAR-2005

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

1 PRODUCT IDENTIFICATION

REAGENT NAME:

METHYL PURPLE INDICATOR

REAGENT CODE:

L297

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%)
67-63-0	ISOPROPYL ALCOHOL (IPA) Flammable liquid; chronic overexposure may cause liver and kidney toxicity ORAL LD50-RAT: 5,045 MG/KG DERMAL LD50-RABBIT: 12,800 MG/KG INHL. LC50-RAT 12,000 PPM/8HR	10-30

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 slight irritation to the skin. May cause moderate

irritation to the eyes. Vapors, gases, mists and/or aerosols may cause irritation to upper respiratory tract.

Odor: Alcohol; Appearance: Dark Green, 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; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:
May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:
Primary route of exposure;Vapors, gases, mists and/or aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:
May cause gastrointestinal irritation with possible nausea, vomiting, diarrhea, incoordination, mental confusion, dizziness and lethargy.

TARGET ORGANS:
Prolonged or repeated exposures may cause defatting-type dermatitis and/or toxicity to the liver and kidney.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Excessive dermal exposure causes defatting and drying of skin. Excessive inhalation of vapors causes dizziness, headache and nausea.

4 FIRST AID MEASURES

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. 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:
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 or foam--Avoid water if possible.
HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition (destructive fires) yields elemental oxides.
FLASH POINT:
90F 32C 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:
Flammable. Store in explosive proof area where electrical equipment meets NFPA code.
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

ISOPROPYL ALCOHOL (IPA)
PEL (OSHA): 400 PPM(500PPM-STEL)
TLV (ACGIH): 200 PPM(400PPM-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.
SKIN PROTECTION:
neoprene gloves-- Wash off after each use. Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav.(70F,21C)	1.000	Vapor Pressure (mmHG)	14.0
Freeze Point (F)	ND	Vapor Density (air=1)	< 1.00
Freeze Point (C)	ND		
Viscosity(cps 70F,21C)	ND	% Solubility (water)	ND

Odor		Alcohol
Appearance		Dark Green
Physical State		Liquid
Flash Point	P-M(CC)	90F 32C
pH As Is (approx.)		7.1
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: Flammable Liquids, n.o.s.
(Isopropyl Alcohol)
PIN: UN1993; Classification: 3;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:

B2 D2B

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	1	Slight Hazard
Fire	3	Serious 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
MSDS status:	03-MAY-1996	REVISED FORMAT	** NEW **
	28-APR-1999		03-MAY-1996
	04-APR-2002	4	28-APR-1999
	07-MAR-2005	16	04-APR-2002

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 11-MAY-2006

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

1 PRODUCT IDENTIFICATION

REAGENT NAME:

NITRITE TITRANT 0.0725N

REAGENT CODE:

L6121

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%)
7664-93-9	SULFURIC ACID Corrosive ORAL LD50-RAT: 2,140 MG/KG DERMAL LD50: NO DATA. INHL. LC50-RAT: 510 MG/M3/2HR	5-10
16774-21-3	CERATE(2-), HEXAKIS (NITRATO-O)-, DIAMMONIUM, (OC-6-11)- Oxidizer;contact with combustible material may cause fire explosion; corrosive (eyes); severe irritation (skin) 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. Mists/aerosols cause irritation to the upper respiratory tract.

Odor: None; Appearance: Yellow, Liquid

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:
Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:
May cause severe irritation or burning of the gastrointestinal tract.

TARGET ORGANS:
Prolonged or repeated exposures may cause primary irritant dermatitis.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Causes irritation of the skin, eyes, and/or respiratory system.

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:

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, 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:

Acidic. Corrosive(Eyes). Do not mix with alkaline material.

STORAGE:

Keep containers closed when not in use. Protect from freezing.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

SULFURIC ACID
PEL (OSHA): 1 MG/M3
TLV (ACGIH): 0.2 MG/M3

CERATE(2-), HEXAKIS (NITRATO-O)-, DIAMMONIUM, (OC-6-11)-
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:
neoprene gloves-- Wash off after each use. Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav.(70F,21C)	1.000	Vapor Pressure (mmHG)	ND
Freeze Point (F)	-5	Vapor Density (air=1)	ND
Freeze Point (C)	-21		
Viscosity(cps 70F,21C)	ND	% Solubility (water)	100.0

Odor		None
Appearance		Yellow
Physical State		Liquid
Flash Point	P-M(CC)	> 200F > 93C
pH As Is (approx.)		< 1.0
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: Corrosive Liquid, Acidic, Inorganic, n.o.s. (Sulfuric Acid)
PIN: UN3264; 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	CORR	DOT corrosive
(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
MSDS status:	30-DEC-1996		** NEW **
	23-JAN-1997	14	30-DEC-1996
	17-JAN-2000	14	23-JAN-1997
	07-JAN-2003	4,16	17-JAN-2000
	08-DEC-2005	16	07-JAN-2003
	19-DEC-2005	16	08-DEC-2005
	11-MAY-2006	8	19-DEC-2005

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Oxygen, compressed (MSDS No. P-4638-F)	**Trade Name:** Oxygen, MediPure™ Oxygen
Chemical Name: Oxygen	**Synonyms:** Dioxygen
Formula: O_2	**Chemical Family:** Permanent gas
Telephone: **Emergencies:** 1-800-645-4633* **CHEMTREC:** 1-800-424-9300* **Routine:** 1-800-PRAXAIR	**Company Name:** Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

* *Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

This section covers materials of manufacture only. See sections 3, 8, 10, 11, 15, and 16 for information on by-products generated during use, especially use in welding and cutting. See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCEN-TRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Oxygen	7782-44-7	>99%*	None currently established	None currently established

**The symbol > means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

WARNING! High-pressure, oxidizing gas.
Vigorously accelerates combustion.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: None currently established (ACGIH, 2004). Hazardous fumes may be generated during welding with this product. See section 16 for more information on welding hazards. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also Central Nervous System (CNS) effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular

Revised

twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT–No harm expected.

SWALLOWING–This product is a gas at normal temperature and pressure.

EYE CONTACT–No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: See section 11, Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See section 11, Toxicological Information.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: Oxygen is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. Keep victim warm and at rest. Call a physician. Advise the physician that the victim has been exposed to a high concentration of oxygen.

SKIN CONTACT: Wash with soap and water; seek medical attention if discomfort persists.

SWALLOWING: This product is a gas at normal temperature and pressure.

EYE CONTACT: Flush eyes thoroughly with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get medical attention if discomfort persists.

NOTES TO PHYSICIAN: Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. See section 11, Toxicological Information.

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable	**UPPER:** Not applicable

EXTINGUISHING MEDIA: Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g., safety shower) is the preferred extinguishing method for clothing fires.

SPECIAL FIRE FIGHTING PROCEDURES: WARNING! High-pressure, oxidizing gas. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Heat of fire can build pressure in cylinder and cause it to rupture. Oxygen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

HAZARDOUS COMBUSTION PRODUCTS: Not applicable

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: WARNING! High-pressure, oxidizing gas. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Remove all flammable materials from vicinity. Oxygen must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation, away from oil, grease, and other hydrocarbons. Separate oxygen cylinders from flammables by at least 20 ft (6.1 m) or use a barricade of noncombustible material. This barricade should be at least 5 ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. Never apply flame or localized heat directly to any part of the cylinder. High temperatures may damage the cylinder and could cause the pressure relief device to fail prematurely, venting the cylinder contents. For other precautions in using this mixture, see section 16.

For further information on storage, handling, and use of this product, see NFPA 55, *Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders*, published by the National Fire Protection Association.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to prevent increased oxygen concentration and, in welding, to keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain a supply of air that is not too rich in oxygen and, during welding, can keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: None required under normal use. However, air-supplied respirators are required while working in confined spaces with this product. For welding, use air-purifying or air-supplied respirators, as appropriate, where local or general exhaust ventilation is inadequate. Adequate ventilation must keep worker exposure below applicable TLVs for fumes, gases, and other by-products of

welding with oxygen. See sections 3, 10, and 16 for details. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear work gloves when handling cylinders; welding gloves for welding. Gloves must be free of oil and grease.

EYE PROTECTION: Wear safety glasses when handling cylinders. For welding, wear goggles with filter lens selected as per ANSI Z49.1. Provide protective screens and goggles, if necessary, to protect others. Select as per OSHA 29 CFR 1910.33

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, shoulder protection, as well as substantial clothing. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	31.9988
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	1.105
SOLUBILITY IN WATER, vol/vol at 32°F (0°C):	0.0489
PERCENT VOLATILES BY VOLUME:	100
BOILING POINT at 1 atm:	-297.4°F (-183°C)
FREEZING POINT at 1 atm:	-361.1°F (-218.4°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, tasteless gas at normal temperature and pressure.

10. Stability and Reactivity

STABILITY:	☐ Unstable	☒ Stable

INCOMPATIBILITY (materials to avoid): Combustible materials, asphalt, flammable materials, especially oils and greases. Oxygen reacts with many materials.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION:	☐ May Occur	☒ Will Not Occur

CONDITIONS TO AVOID: None known.

11. Toxicological Information

The welding process may generate hazardous fumes and gases. (See sections 3, 10, 15, and 16.)

At atmospheric concentration and pressure, oxygen poses no toxicity hazards. At high concentrations, newborn premature infants may suffer delayed retinal damage (retrolental fibroplasia) that can progress to retinal detachment and blindness. Retinal damage may also occur in adults exposed to 100% oxygen for extended periods (24 to 48 hours) or at pressures exceeding atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised. All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

At two or more atmospheres, CNS toxicity occurs. Symptoms include nausea, vomiting, dizziness or vertigo, muscle twitching, vision changes, and loss of consciousness and generalized seizures. At three atmospheres, CNS toxicity occurs in less than two hours; at six atmospheres, in only a few minutes.

Patients with chronic obstructive pulmonary disease retain carbon dioxide abnormally. If oxygen is administered, raising their blood-oxygen concentration, their breathing becomes depressed, and retained carbon dioxide rises to a dangerous level.

Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity.

Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the paranasal sinuses may produce vacuum-type headache.

12. Ecological Information

The atmosphere contains approximately 21% oxygen. No adverse ecological effects expected. Oxygen does not contain any Class I or Class II ozone-depleting chemicals. Oxygen is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure cylinder in a well-ventilated area or outdoors; then slowly discharge gas to the atmosphere.

14. Transport Information

DOT/IMO SHIPPING NAME: Oxygen, compressed

HAZARD CLASS: 2.2	**IDENTIFICATION NUMBER:** UN 1072	**PRODUCT RQ:** None

SHIPPING LABEL(s): OXYGEN. An oxygen label may be used for domestic shipment in the United States and Canada in place of the NONFLAMMABLE GAS and OXIDIZER labels (49 CFR Part 172).

PLACARD (when required): NONFLAMMABLE GAS or OXYGEN

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ: None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No	**PRESSURE:** Yes
DELAYED: No	**REACTIVITY:** No
	FIRE: Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Oxygen does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Oxygen is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Oxygen is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Oxygen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Oxygen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Oxygen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

WARNING: Medical grades of oxygen are subject to strict federal regulations and are for use only under the control of a licensed physician or clinician familiar with the product and its hazards.

ADDITIONAL SAFETY AND HEALTH HAZARDS: ***High-pressure, oxidizing gas.*** Clean all gauges, valves, regulators, piping, and equipment to be used in oxygen service in accordance with CGA pamphlet G-4.1. Keep cylinders and their valves free of oil and grease. Use piping and equipment adequately designed to withstand pressures to be encountered. Close cylinder valve after each use; keep closed even when empty. ***Never use oxygen as a substitute for compressed air.*** Never use an oxygen jet for cleaning purposes of any sort, especially for clothing. Oxygen increases the likelihood of an engulfing fire. ***Never work on a pressurized system.*** If a leak occurs, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

Personnel who have been exposed to high concentrations of oxygen should stay in a well-ventilated or open area before going into a confined space or near an ignition source.

SPECIAL PRECAUTIONS: ***Use in welding and cutting.*** Read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, *Precautions and Safe Practices for Gas Welding, Cutting, and heating,* and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society (AWS), 550 N.W. Le Jeune Rd., Miami, FL 33126, http://www.aws.org/, or see OSHA's Web site at http://www.osha-slc.gov/SLTC/weldingcuttingbrazing/. Order AWS documents from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5710, http://global.ihs.com/.

Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, *Cutting and Welding Processes*. ***Do not strike an arc on the cylinder.*** The defect produced by an arc burn could lead to cylinder rupture.

MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		HMIS RATINGS:	
HEALTH	= 0	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= OX (OXidizer)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA-540
	3001-4000 psig	CGA-577
	4001-5500 psig	CGA-701
PIN-INDEXED YOKE:	0-3000 psig	CGA-870 (Medical Use)
ULTRA-HIGH-INTEGRITY CONNECTION:	0-3000 psig	CGA-714

Use the proper CGA connections. **DO NOT USE ADAPTERS.**

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
AV-8	*Characteristics and Safe Handling of Cryogenic Liquid and Gaseous Oxygen*
G-4	*Oxygen*
G-4.1	*Cleaning Equipment for Oxygen Service*
P-1	*Safe Handling of Compressed Gases in Containers*
P-2	*Characteristics and Safe Handling of Medical Gases*
P-39	*Oxygen-Rich Atmospheres*
SB-2	*Oxygen-Deficient Atmospheres*
SB-8	*Use of Oxy-Fuel Gas Welding and Cutting Apparatus*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

PRAXAIR®

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

GE Betz

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 07-MAR-2005

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

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

OPTISPERSE PQ4684

PRODUCT APPLICATION AREA:

INTERNAL BOILER 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%)
3794-83-0	PHOSPHONIC ACID, (HYDROXYETHYLIDENE)BIS-, TETRASODIUM SALT Irritant (eyes) ORAL LD50-RAT: 990 MG/KG 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 slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

Odor: Slight; 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, foam or water

****

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:
Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:
May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:
Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:
May cause slight gastrointestinal irritation.

TARGET ORGANS:
No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
May cause redness or itching of skin.

4 FIRST AID MEASURES

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. 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:
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:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Protect from freezing.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

PHOSPHONIC ACID, (HYDROXYETHYLIDENE)BIS-, TETRASODIUM SALT
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

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:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav.(70F,21C)	1.159	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	25	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-4		
Viscosity(cps 70F,21C)	24	% Solubility (water)	100.0

Odor		Slight
Appearance		Colorless To Light Yellow
Physical State		Liquid
Flash Point	P-M(CC)	> 200F > 93C
pH As Is (approx.)		11.9
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: Corrosive Liquid, Basic, Inorganic, n.o.s. (Sodium Hydroxide Solution)
PIN: UN3266; 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
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		CODE TRANSLATION
Health	1	Slight Hazard
Fire	1	Slight 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
MSDS status:	27-JUN-1997		** NEW **
	23-JAN-1998	15	27-JUN-1997
	07-MAY-1998	;EDIT:9	23-JAN-1998
	20-NOV-1998	1	07-MAY-1998
	03-JUN-1999	2,3,7,8,16;EDIT:4	20-NOV-1998
	30-AUG-1999	15;EDIT:9	03-JUN-1999
	05-JUL-2001	2	30-AUG-1999
	29-MAR-2002	2,3,4,8,15	05-JUL-2001
	07-MAR-2005	16	29-MAR-2002

Material Safety Data Sheet

This material safety data sheet (MSDS) is provided as a courtesy in response to a customer request. This product is not regulated under, and a MSDS is not required for this product by the OSHA Hazard Communication Standard (29 CFR 1910.1200) because, when used as recommended or under ordinary conditions, it should not present a health and safety hazard. However, use or processing of the product not in accordance with the product's recommendations or not under ordinary conditions may affect the performance of the product and may present potential health and safety hazards.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Petrifilm(TM) Aerobic Count Plates
MANUFACTURER: 3M
DIVISION: Medical Division

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 10/21/2004
Supercedes Date: 09/28/2004

Document Group: 05-3658-1

Product Use:
Specific Use: Used for growing microorganisms.

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
Silicone coated paper	Unknown	50 - 70
Polypropylene film	Unknown	10 - 20
Guar gum	9000-30-0	15 - 20
Acrylate Adhesive - top film	Trade Secret	2 - 8
Adhesive- bottom film	Trade Secret	1 - 5
Hinge tape	Unknown	1 - 5
Media nutrients	Unknown	1 - 3
Sodium pyruvate	113-24-6	< 2

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Film
Odor, Color, Grade: White opaque film with yellow grid, musty odor.
General Physical Form: Solid
Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
No health effects are expected.

Skin Contact:
No health effects are expected.

Inhalation:
No health effects are expected. This product may have a characteristic odor; however, no adverse health effects are anticipated.

Ingestion:
No health effects are expected.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

Skin Contact: Wash affected area with soap and water. If signs/symptoms develop, get medical attention.

Inhalation: No need for first aid is anticipated.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*

5.2 EXTINGUISHING MEDIA
Ordinary combustible material. Use fire extinguishers with class A extinguishing agents (e.g., water, foam). Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Not applicable.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. For industrial or professional use only.

7.2 STORAGE
Store in a cool place. Store away from heat. Store out of direct sunlight.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Not applicable.

8.2.2 Skin Protection
Gloves not normally required.

8.2.3 Respiratory Protection
Not applicable.

8.2.4 Prevention of Swallowing
Not applicable.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Film
Odor, Color, Grade:	White opaque film with yellow grid, musty odor.
General Physical Form:	Solid
Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*
Boiling point	*Not Applicable*
Density	*Not Applicable*
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	*Not Applicable*
Melting point	*No Data Available*
Solubility In Water	*No Data Available*
Solubility in Water	*No Data Available*
Evaporation rate	*Not Applicable*
Volatile Organic Compounds	*No Data Available*
Percent volatile	*No Data Available*
VOC Less H2O & Exempt Solvents	*No Data Available*
Viscosity	*Not Applicable*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: None known

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	Not Specified
Carbon dioxide	Not Specified

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not applicable.

CHEMICAL FATE INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Reclaim if feasible. If product can't be reclaimed, dispose of waste product in a sanitary landfill. Alternatively, incinerate the waste product in an industrial, commercial, or municipal incinerator. Additional Information: Sterilize used plates and incinerate waste product in a facility permitted to accept biological wastes. As an alternative, dispose of waste product in a facility permitted to accept biological wastes.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s):
70-2005-7212-4, 70-2005-7215-7

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS
Contact 3M for more information.

311/312 Hazard Categories:
Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - No Delayed Hazard - No

STATE REGULATIONS
Contact 3M for more information.

CHEMICAL INVENTORIES
This material contains one or more substances not listed on the TSCA Inventory. Commercial use of this material is regulated by the FDA.

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

Additional Information: The carbohydrate is New Jersey trade secret number 04499600-6182P.

INTERNATIONAL REGULATIONS

Non hazardous according to WHMIS criteria.

Contact 3M for more information.

WHMIS: Non-hazardous

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 0 **Flammability:** 1 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Revision Changes:
Section 3: Potential effects from eye contact was modified.
Section 3: Potential effects from skin contact information was modified.
Section 3: Potential effects from inhalation information was modified.
Section 13: Waste disposal method comment was modified.

DISCLAIMER: The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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3M MSDSs are available at www.3M.com

Common Name: VALVE ACTION PAINT MARKER

Manufacturer: LA-CO INDUSTRIES

MSDS Revision Date: 4/21/2004

Grainger Item Number(s): 1FGR9, 2F934, 2F936, 2F938, 2F940

Manufacturer Model Number(s): 1510 3/32, 96820, 96821, 96822, 96823

MSDS Table of Contents

Click the desired link below to jump directly to that section in the MSDS.

MATERIAL SAFETY DATA SHEET

BARNES DISTRIBUTION
1301 E. 9TH STREET, #700
CLEVELAND, OH 44114
(800) 726-9626

MSDS FORM NO.: 19136

ITEM NO.:

MATERIAL SAFETY DATA SHEET

VALVE ACTION PAINT MARKER

PART #: 19136

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS NAME: VALVE ACTION PAINT MARKER

PRODUCT CAS: (NONE)

PRODUCT CODE:

SYNONYMS: 19136; VALVE ACTION PAINT MARKER

COMPANY IDENTIFICATION:

NAME: LA-CO INDUSTRIES, INC. / MARKAL COMPANY

ADDRESS: 1201 PRATT BLVD.

ADDRESS:
CITY: ELK GROVE VILLAGE
STATE: IL
ZIP: 60007-5746

FOR INFORMATION, CALL: 847-956-7600

EMERGENCY NUMBER: 800-424-9300

EMERGENCY AGENCY:
NUMBER:

MSDS CREATION DATE: 4/21/2004

SUPERSEDES DATE:

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

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CHEMICAL NAME	CAS	MIN	MAX
MINERAL SPIRITS	64742-88-7	30	50
VM&P NAPHTHA	8032-32-4	10	30
XYLENE	1330-20-7	5	10

MISCELLANEOUS:

CHEMICAL	ACGIH TWA
VM&P	TWA 300 PPM (1370 MG/M3)
XYLENE	TWA 100 PPM STEL = 150 PPM

LBS OF VOC PER GALLON COATING (MINUS WATER): 0

COATING DENSITY (LBS/GAL): 0
SOLVENT DENSITY (LBS/GAL): 0

PERCENT SOLVENT (VOLUME): 0
PERCENT SOLIDS (VOLUME): 0
PERCENT WATER (VOLUME): 0

SECTION 3 - HAZARDS IDENTIFICATION

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NFPA:
HEALTH 3
FIRE 2
REACTIVITY 1
OTHER

HMIS:
HEALTH 3
FIRE 1
REACTIVITY 1
SPECIAL PROTECTION

POTENTIAL HEALTH EFFECTS:

TARGET ORGANS: EYES, SKIN, INGESTION, INHALATION.

EYE: LIQUID AND VAPORS CAN IRRITATE EYES.

SKIN:
MAY PRODUCE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY RESULT IN DEFATTING AND DRYING OF SKIN, WHICH MAY RESULT IN DERMATITIS.

INGESTION:
PRODUCT IS RESUMED TO BE SLIGHTLY TOXIC. MAY CAUSE NERVOUS SYSTEM DEPRESSION. SMALL AMOUNTS OF LIQUID ASPIRATED IN TO THE LUNGS DURING INGESTION OR FROM VOMITING MAY RESULT IN SEVERE LUNG DA AGE.

INHALATION:
MAT PRODUCE IRRITATION OF THE NOSE, THROAT, RESPIRATORY TRACT, AND MUCOUS MEMBRANES. HIGH CONCENTRATIONS OF VAPOR MAY PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

MISCELLANEOUS:

SECTION 4 - FIRST AID MEASURES

top

EYE:
IMMEDIATELY FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. REMOVE CONTACT LENSES. GET MEDICAL ATTENTION.

SKIN:
REMOVE CONTAMINATED CLOTHING. WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER OR WASH WITH SOAP AND WATER. CONSULT PHYSICIAN IF IRRITATION DEVELOPS.

INGESTION:
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON. DO NOT INDUCE VOMITING. IF VOMITING IS SPONTANEOUSLY OCCURS, KEEP THE VICTIM'S HEAD BELOW THE HIPS TO PREVENT ASPIRATION INTO THE LUNGS.

INHALATION:
REMOVE VICTIM TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. GET MEDICAL ATTENTION.

NOTES TO PHYSICIAN:

SECTION 5 - FIRE FIGHTING MEASURES

top

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

SPECIAL FIRE FIGHTING PROCEDURES:
KEEP PERSONNEL REMOVED AND UPWIND OF ANY FIRE. WEAR FULL FIRE FIGHTING TURN-OUT GEAR (FULL BUNKER GEAR), AND RESPIRATORY PROTECTION (SCBA). CONTAINERS EXPOSED TO INTENSE HEAT SHOULD BE COOLED WITH WATER TO PREVENT PRESSURE BUILDUP, WHICH COULD RESULT ON CONTAINER RUPTURE CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

EXTINGUISHING MEDIA: WATER FOG, FOAM, DRY CHEMICAL, CARBON DIOXIDE.

FLASH POINT: 73 DEG F/23 DEG C (SETFLASH)

FLAMMABLE LIMITS:
LOWER LIMIT: N.D.
UPPER LIMIT: N.D.

AUTOIGNITION TEMPERATURE:

GENERAL INFORMATION:

SECTION 6 - ACCIDENTAL RELEASE MEASURES

DISPOSAL: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

SPILLS/LEAKS:
TAKE UP SPILL WITH ABSORBENT MATERIAL AND PLACE IN AN NON-LEAKING CONTAINER.
SEAL CONTAINER FOR PROPER DISPOSAL.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
HANDLE AS A FLAMMABLE LIQUID. DO NOT DROP CONTAINER. READ ALL LABEL CAUTIONS. DO CUT, WELD, GRIND OR DRILL NEAR CONTAINERS.

STORAGE:
STORE AWAY FROM IGNITION SOURCES, IN A COOL, WELL VENTILATED AREA.
STORE AWAY FROM INCOMPATIBLE CHEMICALS.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS: LOCAL EXHAUST.

EYES: SAFETY GLASSES.

SKIN: USE IMPERVIOUS GLOVES.

CLOTHING: EYEWASH OR AND SAFETY SHOWER.

RESPIRATORS: USE A NIOSH/MSHA APPROVED BODY COVERING CLOTHING AS NEEDED.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/ODOR: ORGANIC SOLVENT

pH: N.A.

VAPOR PRESSURE: 9.5 FOR XYLENE

VAPOR DENSITY: N.D.

EVAPORATION RATE: 0.75 FOR XYLENE

VISCOSITY: N.A.

BOILING POINT: 244 DEG F/118 DEG C FOR VM&P NAPHTHA

FREEZING/MELTING POINT: N.A.

DECOMPOSITION TEMPERATURE: N.A.

SOLUBILITY:
IN WATER: INSOLUBLE

SPECIFIC GRAVITY: 1.1

MOLECULAR FORMULA: N.A.

MOLECULAR WEIGHT: N.A.

MISCELLANEOUS:

VOC:
45-60% W/W
65%-70% V/V

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY: STABLE

CONDITIONS TO AVOID: NONE.

INCOMPATIBILITIES WITH OTHER MATERIALS: OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS: N.D.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION: NO DATA

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: NO DATA

SECTION 13 - OTHER PRECAUTIONS

OTHER PRECAUTIONS: NO DATA

WORK/HYGIENIC PRACTICES: WASH HANDS AFTER USE.

SECTION 14 - TRANSPORT INFORMATION

TRANSPORTATION INFORMATION:
D.O.T. US CONSUMER COMMODITY ORM-D (LESS THAN 30 KG ROSS PACKAGE WEIGHT)
COMBUSTIBLE LIQUID, N.O.S. HAZARD CLASS 3, UN NO 1993, PACKING GROUP III
(GREATER THAN 30 KG GROSS PACKAGE WEIGHT).
TDG (CANADA) CONSUMER COMMODITY ORM-D (LESS THAN 30 KG GROSS PACKAGE WEIGHT)

COMBUSTIBLE LIQUID, N.O.S. HAZARD CLASS 3, UN NO 1993, PACKAGING GROUP III (GREATER THAN 30 KG GROSS PACKAGE WEIGHT).

INTERNATIONAL MARITIME ORGANIZATION (IMO) EXEMPT (<.51/MARKER)
INTERNATIONAL AIR TRANSPORT FLAMMABLE LIQUIDS N.O.S.
UN NO 1993 ADR: UN 1263
CLASS 3
ITEM 31 DEG C
HAZARD IDENTIFICATION NO 30
CEFIC TREMCARD IS NOT APPLICABLE
ICAO: NOT DETERMINED

AUSTRALIAN CODE FOR THE TRANSPORT OR DANGEROUS GOODS:
DANGEROUS GOOD CLASS AND SUBSIDIARY RISK: NOT DETERMINED.

LABEL INFORMATION: NO DATA

SECTION 15 - REGULATORY INFORMATION

REGULATORY INFORMATION:
APPEARS ON THE CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROP 65) SUBSTANCES LIST.
APPEARS ON THE MASSACHUSETTS SUBSTANCES LIST.
APPEARS ON THE NEW JERSEY RIGHT-TO-KNOW HAZARDOUS SUBSTANCE LIST.
APPEARS ON THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST.
APPEARS ON THE CANADIAN WHMIS INGREDIENTS DISCLOSURE LIST.

U.S.A.:
OSHA HAZARD STATUS:
THIS PRODUCT IS CONSIDERED TO BE HAZARDOUS AS DEFINED BY THE U.S. OSHA HCS (29 CFR 1910.1200).

EPA SARA SEC 311/312 HAZARD CATEGORIES:
IMMEDIATE (ACUTE) HEALTH HAZARD, FIRE HAZARD

TOXIC SUBSTANCES CONTROL ACT (TSCA) ALL INGREDIENTS CONTAINED IN THIS PRODUCT ARE LISTED ON THE U.S. EPA TSCA CHEMICAL SUBSTANCE INVENTORY.

CANADA:

WHMIS STATUS:
THIS PRODUCT IS CONSIDERED TO BE HAZARDOUS AS DEFINED BY CANADIAN WHMIS CONTROLLED PRODUCTS REGULATIONS

WHMIS RATING: D-1B, B-2

WHMIS PRECAUTIONARY STATEMENT: NONE REQUIRED.

E.U.:
EUROPEAN INVENTORY OF EXISTING CHEMICAL SUBSTANCES:
ALL INGREDIENTS CONTAINED IN THIS PRODUCT ARE LISTED ON THE EUROPEAN INVENTORY OF EXISTING CHEMICALS SUBSTANCES (EINECS). CATEGORIES OF DANGER LABELING INFORMATION; FLAMMABLE (F) HARMFUL (XN) RISK (R).

AUSTRALIA:
WORKSAFE AUSTRALIA STATUS:
THIS PRODUCT IS CLASSIFIED AS HAZARDOUS ACCORDING TO CRITERIA OF WORKSAFE AUSTRALIA.

SECTION 16 - ADDITIONAL INFORMATION

ADDITIONAL INFORMATION: NO DATA

GE Betz

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 07-JUL-2005

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

1 PRODUCT IDENTIFICATION

REAGENT NAME:

POTASSIUM THIOCYANATE

REAGENT CODE:

L6054

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%)
333-20-0	POTASSIUM THIOCYANATE Irritant (eyes and skin); potential nervous system toxin ORAL LD50-RAT: 854 MG/KG DERMAL LD50: NO DATA. INHL. LC50: NO DATA.	15-40

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. May be absorbed by skin.

May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

Odor: None; Appearance: Colorless, Liquid

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. May be absorbed by skin.

ACUTE EYE EFFECTS:
May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:
Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:
May cause gastrointestinal irritation with possible nausea, vomiting, diarrhea, incoordination, mental confusion, dizziness and lethargy.

TARGET ORGANS:
Prolonged or repeated exposures may cause CNS depression and/or primary irritant dermatitis.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
May cause redness or itching of skin.

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:
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:
Clean spill immediately. Wash contaminated skin promptly.
STORAGE:
Keep containers closed when not in use. Do not store at elevated temperatures. Do not store near acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS
Consult local authorities for acceptable provincial values.

CHEMICAL NAME

POTASSIUM THIOCYANATE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:
adequate ventilation
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:
splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav.(70F,21C)	1.000	Vapor Pressure (mmHG)	ND
Freeze Point (F)	ND	Vapor Density (air=1)	ND
Freeze Point (C)	ND		
Viscosity(cps 70F,21C)	ND	% Solubility (water)	100.0

Odor		None
Appearance		Colorless
Physical State		Liquid
Flash Point	P-M(CC)	> 200F > 93C
pH As Is (approx.)		7.0
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 - 100% active ingredient human oral LDLo: 80 mg/kg
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: Not Regulated

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

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	2	Moderate 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
MSDS status:	30-DEC-1996		** NEW **
	11-AUG-1999		30-DEC-1996
	06-AUG-2002	4	11-AUG-1999
	07-JUL-2005	16	06-AUG-2002

GE Betz

GE Betz Canada, Inc.
3451 Erindale Station Road
Mississauga, Ontario L5C 2S9
Business telephone: (905) 279-2222

Material Safety Data Sheet

Issue Date: 04-MAR-2004

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

1 PRODUCT IDENTIFICATION

REAGENT NAME:

POTASSIUM IODIDE-IODATE N/63 (0.0158 N)

REAGENT CODE:

L6577

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%)
7681-11-0	POTASSIUM IODIDE May be irritating (dusts) or corrosive (solutions) by all routes and cause allergic respiratory and skin reactions; potential thyroid toxin; repeated ingestion may cause iodism; reproductive toxin ORAL LD50: NO DATA. DERMAL LD50: NO DATA. INHL. LC50: NO DATA.	1-5

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

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EMERGENCY OVERVIEW

May cause slight irritation to the skin. Potential skin sensitizer. May cause moderate irritation to the eyes. May cause irritation to mucous membranes. Repeated exposure may result in respiratory sensitization.

Odor: None; Appearance: Colorless, Liquid

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

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POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:
Primary route of exposure; May cause slight irritation to the skin. Potential skin sensitizer.

ACUTE EYE EFFECTS:
May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:
May cause irritation to mucous membranes. Repeated exposure may result in respiratory sensitization.

INGESTION EFFECTS:
Iodide salts act principally as expectorants or diuretics with stomach pain. May cause allergic response. Repeated ingestion of iodides may cause iodism characterized by brassy taste in the mouth, cold symptoms and rash.

TARGET ORGANS:
Prolonged or repeated exposures may cause allergic reactions and/or toxicity to the reproductive system.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Inhalation may cause eye, nose, throat and lung irritation and possible respiratory sensitization or asthma. Skin contact may cause moderate irritation to severe burns and sensitization.

4 FIRST AID MEASURES

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SKIN CONTACT:
Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:
Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:
Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

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

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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

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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

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HANDLING:
Normal chemical handling.

STORAGE:
Keep containers closed when not in use. Reasonable and safe chemical storage. Protect from freezing.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

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EXPOSURE LIMITS

Consult local authorities for acceptable provincial values.

CHEMICAL NAME

POTASSIUM IODIDE

PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:
adequate ventilation
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:
splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

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Specific Grav.(70F,21C)	1.000	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	32	Vapor Density (air=1)	< 1.00
Freeze Point (C)	0		
Viscosity(cps 70F,21C)	ND	% Solubility (water)	100.0

Odor		None
Appearance		Colorless
Physical State		Liquid
Flash Point	P-M(CC)	> 200F > 93C
pH As Is (approx.)		8.0
Evaporation Rate (Ether=1)		< 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

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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

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

12 ECOLOGICAL INFORMATION