

P.O. Box 950 • Condon MT 59826 • 800-922-5255 • FAX 406-754-2896

THE PYROCAT-HD IN GLYCOL DEVELOPER

CAT. NUMBER 01-5091 LIQUID TO MAKE 10 LITERS CAT. NUMBER 01-5093 LIQUID TO MAKE 50 LITERS OF WORKING SOLUTION

Pyrocat-HD in glycol is a high acutance developer formulated by Sandy King as an alternative to other pyrogallol based staining developers. Pyrocat-HD gives negatives of fine grain and full emulsion speed and is suitable for all types of development methods, including rotary, normal agitation, minimal agitation and stand development. Packaging in glycol stabilizes the formula to give a very long shelf life and long term consistency.

FOR YOUR CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warnings listed here. Always use rubber gloves and dust mask when using chemicals.

Catechol (pyrocatechin), has a high vapor pressure and it is a phenol. The high vapor pressure means that solid catechol evaporates readily. When you open a bottle containing solid catechol, you can smell it. Always store the solid catechol in a tightly capped glass container. When mixing a solution containing catechol, work in a ventilated area. When catechol is in solution, its high vapor pressure is not a problem.

The fact that catechol is a phenol means that it is corrosive and can cause skin burns. If you should spill a solution of catechol, wash the area (or skin) with soap and water. Use tongs or rubber gloves whenever possible when working with this compound or its solutions.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

Please consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area.

Pyrocat-HD Film Developer

Stock Solution A

Propylene Glycol	75 ml	375 ml
Sodium Metabisulfite	1 g	5 q
Pyrocatechin	5 g	25 g
Phenidone	.2g	1 a
Potassium Bromide	.1g	.5 q
Propylene Glyco!	100 ml	500 ml

Stock Solution B

Distilled Water	75 ml	375 ml
Potassium Carbonate	75 g	375 g
Water to make	100 ml	500 ml

Working Solution

To make a standard working solution mix 1 part A with 1 part B with 100 parts water.

The working solution can be made quite a bit more energetic (faster working) by using a dilution of 3:2:100 or 5:3:100. The stronger dilutions would generally be used only when developing negatives for printing with alternative processes, which require negatives of much greater contrast than silver papers.

Use a plain water stop bath for one minute or an acetic stop bath at one-half normal strength. Use an alkaline fixer (Such as TF-4) for 5 minutes. Wash in running water for 10-15 minutes.





Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment
3 000	Health Hazard 3 Fire Hazard 1	
<u> </u>	Reactivity (0)	See Section 15.

Common Name/ Trade Name	Pyrocatechol	Catalog Number(s).	P1466
		CAS#	120-80-9
Manufacturer	SPECTRUM CHEMICAL MFG. CORP.	RTECS	UX1050000
	14422 S. SAN PEDRO STREET GARDENA, CA 90248	TSCA	TSCA 8(b) inventory: Pyrocatechol
Commercial Name(s)	Not available.	CI#	Not available.
Synonym	1,2-Benzenediol	INI CACIF OF	TRACTO CITALON
Chemical Name	Catechol	8	<u> EMERGENCY</u> C (24hr) 800-424-9300
hemical Family Not available.		CALL (310) 5	16-8000
Chemical Formula	C6H6O2		
Supplier	SPECTRUM CHEMICAL MFG. CORP. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	COLUMN CONTRACTOR CONT	

Exposure Limits Name CAS # TWA (mg/m³) STEL (mg/m³) CEIL (mg/m³) %	
Name CAS # TWA (mg/m³) STEL (mg/m³) CEIL (mg/m³) %	
	% by Weigh
1) Pyrocatechol 120-80-9 20 10	100

Section 3. Hazards Identification

Potential Acute Health Effects

Extremely hazardous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (sensitizer, permeator). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Pyrocatechol	Page Number: 2
Potential Chronic Health Effects	Extremely hazardous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (sensitizer, permeator). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Section 4. First A	id Measures
Eye Contact	Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.
Skin Contact	If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Serious Ingestion	Not available.

Section 5. Fire and E	xplosion Data
Flammability of the Product	May be combustible at high temperature.
Auto-Ignition Temperature	Not available.
Flash Points	CLOSED CUP: 127,22°C (261°F). OPEN CUP: 136.67°C (278°F).
Flammable Limits	Not available.
Products of Combustion	These products are carbon oxides (CO, CO2).
Fire Hazards in Presence of Various Substances	Not available.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards	Not available.
Special Remarks on Explosion Hazards	Not available.

Pyrocatechol	·		Page Number: 3
Section 6. Accidental	Release Measures	omaas teediin haastiili mir maasii ⁹⁴ HG teediin teedaa ka k	
Small Spill	Use appropriate tools to put the spilled solid in a co	nvenient waste d	isposal container.
Large Spill	Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.		
Section 7. Handling	and Storage		
Precautions	Keep container dry. Keep away from heat. Keep risk, evaporate the residue under a fume hood. Go breathe dust. Never add water to this product equipment. If ingested, seek medical advice immeskin and eyes.	ound all equipme In case of insuf	ent containing material. Do not ingest. Do not ficient ventilation, wear suitable respiratory
Storage	Keep container dry. Keep in a cool place. Ground be stored in a separate safety storage cabinet or ro		ontaining material. Corrosive materials should
Section 8. Exposure	Controls/Personal Protection		
Engineering Controls	Use process enclosures, local exhaust ventilation recommended exposure limits. If user operations airborne contaminants below the exposure limit.		
Personal Protection	Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.		
a Large Spill	Splash goggles. Full suit. Vapor and dust respi should be used to avoid inhalation of the product. specialist BEFORE handling this product.		
a Large Spill Exposure Limits	should be used to avoid inhalation of the product. specialist BEFORE handling this product. TWA: 5 (ppm) TWA: 20 (mg/m³) Consult local authorities for acceptable exposure line	Suggested prote	
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Continued on Next Page

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Pyrocatechol		Page Number: 4
Solubility	Soluble in cold water.	

Section 10. Stability	and Reactivity Data	
Stability	The product is stable.	
Instability Temperature	Not available.	
Conditions of Instability	Not available.	
Incompatibility with various substances	Not available.	
Corrosivity	Non-corrosive in presence of glass.	,
Special Remarks on Reactivity	Not available.	
Special Remarks on Corrosivity	Not available.	
Polymerization	No.	

Section 11. Toxicolo	ogical Information					
Routes of Entry	Dermal contact. Eye contact. Inhalation, Ingestion.					
Toxicity to Animals	Acute oral toxicity (LD50): 210 mg/kg [Guinea pig]. Acute dermal toxicity (LD50): 800 mg/kg [Rabbit].					
Chronic Effects on Humans	The substance is toxic to lungs, mucous membranes.					
Other Toxic Effects on Humans	Extremely hazardous in case of skin contact (corrosive, irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (sensitizer, permeator).					
Special Remarks on Toxicity to Animals	Not available.					
Special Remarks on Chronic Effects on Humans	Not available.					
Special Remarks on other Toxic Effects on Humans	Not available.					

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products ma arise.
·	
Toxicity of the Products of Biodegradation	The products of degradation are more toxic.

Section 13. Disposal Considerations

Waste Disposal

Section 14. Transport Information

DOT Classification

CLASS 6.1: Poisonous material.

Identification

: Toxic solid, organic, n.o.s. (Pyrocatechol) : UN2811 PG: III

Special Provisions for

Transport

Not available.

DOT (Pictograms)



Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations Pennsylvania RTK: Pyrocatechol Massachusetts RTK: Pyrocatechol TSCA 8(b) inventory: Pyrocatechol

SARA 313 toxic chemical notification and release reporting: Pyrocatechol

CERCLA: Hazardous substances.: Pyrocatechol

Camornia

Proposition 65

Warnings

Other Regulations

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

Other Classifications

WHMIS (Canada)

CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC)

R35- Causes severe burns.

R43- May cause sensitization by skin

contact.

HMIS (U.S.A.)

Health Hazard		3	
Fire Hazard		1	
Reactivity	(0)
Personal Protection	(i)

National Fire Protection Association (U.S.A.)

Health



Flammability

Reactivity

Specific hazard

WHMIS (Canada) (Pictograms)



DSCL (Europe) (Pictograms)



Pyrocatechol		Page Number: 6
TDG (Canada) (Pictograms)		
ADR (Europe) (Pictograms)		
Protective Equipment	Gloves.	



Synthetic apron.



Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.

Section 16. Other Information MSDS Code P4870 References Not available. Other Special Not available. Consider ations Validated by Sonia Owen on 8/11/2006. Verified by Sonia Owen. Printed 9/13/2006. CALL (310) 516-8000

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.

Material Safety Data Sheet

WEGO CHEMICAL & MINERAL CORP

239 Great Neck Road

Great Neck, NY 11021

Date of Preparation: 3/2001

PHENIDONE

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Phenidone Chemical Formula: C9H10N2O

CAS Number: 92-43-3

Other Designations: 1-Phenyl-3-pyrazolidinone; 1-Phenyl-3-pyrazolidone; 1-Phenyl-3-oxopyrazolidine; 3-Pyrazolidinone, 1-

phenyl-; Pyrazolid-3-one, 1-phenyl-

General Use:

Emergency Telephone: 1-800-424-9300 (Chemtrec)

Section 2 - Composition / Information on Ingredients

Yoursen dieses Br			
Ingredient Name	CAS Number	FOR THE CASE WAY TO	
Phenidone	CAD LARGIDEI	EINECS/ELINCS	% wt or % vol
1 remove	92-43-3	200 166	
	72-43-3	202-155-1	97
			, , , , , , , , , , , , , , , , , , ,

Trace Impurities:

ı	700							
ı		OSHA	PEL	ACCI	VYTY	BYEOGE	2 m m m	
ı	Ingredient	TWA	STEL	TWA		NIOSE		NIOSH
ı	Phenidone	none estab.			STEL	TWA	STEL	IDLH
ļ.		none comb.	none estab.	none estab.	none estab.	nonc estab,	none estab.	none estab.

Section 3 - Hazards Identification

ፊልልልል Emergency Overview ልልልል

Appearance: slightly beige. Warning! Material is light sensitive. Harmful if swallowed. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

	HM	<u>(1</u> \$
	H	2
	F	0
	R	0
	PPE	f ,
-	†Sec.	8

Potential Health Effects

Primary Entry Routes: Inhalation, ingestion, eye and skin contact.

Target Organs: Acute Effects

Eye: May cause eye irritation. Skin: May cause skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Carcinogenicity: IARC, NTP, and OSHA do not list Phenidone as a carcinogen.

Medical Conditions Aggravated by Long-Term Exposure:

Chronic Effects: No information found.

Section 4 - First Aid Measures

Eye: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treat symptomatically and supportively.

Special Precautions/Procedures:

NFPA

PHENIDONE

Section 5 - Fire-Fighting Measures

Flash Point: Not applicable

Autoignition Temperature: Not applicable

LEL: Not available UEL: Not available

Flammability Classification:

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Unusual Fire or Explosion Hazards: Hazardous Combustion Products:

Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Use proper personal protective equipment as indicated in Section 8.

Small Spills: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light.

Storage Requirements: Keep containers tightly closed. Store protected from light. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls:

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at

Administrative Controls:

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area. Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygicne after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

PHENIDONE

Section 9 - Physical and Chemical Properties

Physical State: Solid powder Appearance: Slightly beige powder

Odor: none reported

Vapor Pressure: not available Vapor Density (Air=1): Formula Weight: 162,19

Density/Specific Gravity (H2O=1, at 4 °C):

pH:

Water Solubility: Soluble in hot water.

Other Solubilities: Boiling Point:

Freezing/Melting Point: 122-123 °C

Viscosity: Refractive Index: Surface Tension:

% Volatile:

Evaporation Rate: not available

Section 10 - Stability and Reactivity

Stability: Phenidone is stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive.

Polymerization: Hazardous polymerization can_or_cannot occur.

Chemical Incompatibilities: Strong oxidizing agents, strong acids, strong bases, direct light.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Hazardous Decomposition Products: Thermal oxidative decomposition of Phenidone can produce nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen.

Section 11- Toxicological Information

Toxicity Data:

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: No information found.

Neurotoxicity: No information found. Mutagenicity: No information found. Acute Oral Effects:

Rat, oral, LD50: 200 mg/kg

See NIOSH, RTECS (UQ8750000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Not available.

Environmental Fate: Not available.

Environmental Degradation: Not available, Soil Absorption/Mobility: Not available.

Section 13 - Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Disposal Regulatory Requirements:

Container Cleaning and Disposal:

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: Toxic solid,

organic, n.o.s. (I-Fhenyl-3-Pyrazolidinone)

Shipping Symbols: Hazard Class: 6.1

ID No.: UN2811
Packing Group: III
Label: TOXIC

Special Provisions (172.102):

Packaging Authorizations

a) Exceptions:

b) Non-bulk Packaging:

c) Bulk Packaging:

Quantity Limitations

a) Passenger, Aircraft, or Railcar;

b) Cargo Aircraft Only:

Vessel Stowage Requirements

a) Vessel Stowage:

b) Other:

Section 15 - Regulatory Information

US FEDERAL

10-0870

TSCA

CAS# 92-43-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals arc on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section-12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

None of the chemicals in this material have an RQ.

Section 302 (TPO)

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class I Ozone depletors. This material does not contain any Class 2 Ozone depletors.

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the

OSHA: None of the chemicals in this product are considered highly hazardous by OSHA: STATE

CAS# 92-43-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Section 16 - Other Information

Disclaimer: All information, recommendations and suggestions appearing herein are based upon sources believed to be reliable: However, it is the users responsibility to determine the safety, toxicity and suitability for its own use of this product. WEGO CHEMICAL & MINERAL CORP. DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE USE BY OTHERS OF

10-1280 Recd 3-18-94

REPORT NUMBER: 971

VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

PAGE: 001

VERSION: 001

MSDS NO: GZ003047

EFFECTIVE DATE: 11/23/92

PRODUCT: SODIUM METABISULFITE and sodium Bisulfite

ORDER NO: PROD NO :

VAN WATERS & ROGERS INC. , SUBSIDIARY OF UNIVAR (206)889-3400

6100 CARILLON POINT , KIRKLAND

, WA 98033

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMIREC (800)424-9300

FOR PRODUCT AND SALES INFORMATION -----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE AT 509-534-0405 SPOKANE , NA. // VW&R SPOKANE

PRODUCT NAME: SODIUM METABISULFITE

MSDS #: GZ003067

~ A. GENERAL INFORMATION

TRADE NAME (COMMON NAME): SODIUM METABISULFITE (anhydrous sodium bisulfite, ABS, sodium pyrosulfite)

C.A.S. No. 7681-57-4

CHEMICAL NAME AND/OR SYNONYM: Sodium Metabisulfite

FORMULA: Na28205

MOLECULAR WEIGHT: 190,11

CURRENT ISSUE DATE: May, 1988

B. FIRST AID MEASURES

INHALATION: Remove to fresh air. Get medical assistance for irritation or any other symptoms.

INGESTION: If conscious, give plenty of water or milk. Induce vomiting by touching finger to back of throat. Get immediate medical attention.

SKIN: Promptly wash with plenty of soap and water,

EYES: Immediately flush eyes with plenty of water, for at least 15 minutes, Get medical attention.

REPORT NUMBER: 971 MSDS NO: GZ003067 EFFECTIVE DATE: 11/23/92

VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

PAGE: 002

VERSION: 001

PRODUCT: SODIUM METABISULFITE

ORDER NOT PROD NO :

C. HAZARDS INFORMATION

HEALTH -

INMALATION: Inhalation of product dust or mist may irritate respiratory tract.

INGESTION: May irritate gastrointestinal tract. Very large doses cause violent colic, diarrhea, depression, and death. Reference (b). May cause severe allergic reaction in some asthmatics and sulfite sensitive individuals.

SKIN: Repeated or prolonged contact with dust may cause irritation: Contact with solution will irritate. See pH, Section F.

EYES: Dust or mist may irritate or burn eyes. Solutions will irritate or burn. See pH, Section F.

PERMISSIBLE CONCENTRATION: AIR: (SEE SECTION J)

TLV:5 mg/M3

BIOLOGICAL: None established.

UNUSUAL CHRONIC TOXICITY: None known.

FIRE AND EXPLOSION -

-FLASH FOINT: Not flammable.

AUTO IGNITION TEMPERATURE: NA

FLAMMABLE LIMITS IN AIR (% BY VOL.): LOWER - NA UPPER - NA UNUSUAL FIRE AND EXPLOSION HAZARDS: See Hazardous Decomposition Products, Section G.

D. PRECAUTIONS/PROCEDURES

--FIRE-EXTINGUISHING AGENTS RECOMMENDED - NA

FIRE EXTINGUISHING AGENTS TO AVOID: NA

SPECIAL FIRE FIGHTING PRECAUTIONS: Wear NIOSH-approved self-contained breathing apparatus.

VENTILATION: Local exhaust if dusty or misty condition prevails. The TLV may be exceeded without visual warning.

NORMAL HANDLING: Avoid contact with eyes, skin, clothing. Avoid breathing dust or mist. Use normal personal hygiene and housekeeping. Keep away from water or acids or heat.

STORAGE: Cool, dry, well-ventilated space away from acids and oxidizing agents. (Try to avoid tendency of product to cake). Releases sulfur dioxide gas slowly at ambient temperatures - see odor, Section F).

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E):

Promptly sweep up with minimum dusting and shovel into an empty
container and close. Cautiously spray residue with plenty of water.

Provide ventilation to clear sulfur dioxide fumes which will be
generated as a result of water contact. (See Section I for disposal
methods.)

SPECIAL: FRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: SIGNAL WORD - DANGER: Avoid contact with acid and oxidizers.

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VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

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PRODUCT: SOOTUM METABISULFITE

ORDER NO: PROD NO :

E, PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Where required, use a NIOSH-approved respirator for dust, mist, and/or sulfur dioxide gas, as conditions indicate. Some exposures may require NIOSH-approved self-contained breathing apparatus or supplied-air respirator.

EYES AND FACE: Wear hard hat (or other head covering) and chemical safety gosgles. Do not wear contact lenses,

HANDS, ARMS, AND BODY: For handling dry material, wear cotton gloves and full work-clothing, including long-sleeved shirt and trousers. When handling solutions and there is prolonged or repeated contact, wear impervious gloves, clothing and boots,

OTHER CLOTHING AND EQUIPMENT: Eye-wash/safety shower facility

F. PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): SOLID

APPEARANCE AND ODOR: Fine, white granular product. Pungent sulfur dioxide gas oder.

BOILING FOINT: Decomposes above 150 Degrees C

MELTING POINT: Decomposes above 150 Degrees C

SPECIFIC GRAVITY (H20=1): 1.48

VAPOR DENSITY (AIR=1): NA

SOLUBILITY IN WATER (% by Weight): 39% at 16 Degrees C

pH: 1X Solution, pH = 4.3 (approx.)

VAPOR PRESSURE NA

EVAFORATION RATE: NA

% VOLATILES BY VOLUME (At 20 Degrees C): NA

G. REACTIVITY DATA

STABLLITY: STABLE

CONDITIONS TO AVOID: Temperatures above 150 Degrees C cause evolution of toxic and corresive gas (sulfur dioxide).

INCOMPATIBILITY. (MATERIALS TO AVOID): Oxidizers may cause strong exothermite reactions. Acids yield sulfur dioxide gas, which is toxic and corrosive. Water increases the natural rate of yield of sulfur dioxide

MAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide gas: see comments in INCOMPATIBILITY (MATERIALS TO AVOID). Sodium sulfide residue: flammable, dangerous fire risk, strong irritant to skin and tissue, incompatible with acids.

MAZARDOUS POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: NA

H, HAZARDOUS INGREDIENTS (Mixtures Only)

REPORT NUMBER: 971 MSDS NO: GZGGGG7 EFFECTIVE DATE: 11/23/92

VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

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VERSION: 001

PRODUCT: SODIUM METABISULFITE

ORDER NO:

MATERIAL OR COMPONENT/C.A.S. #: NA

I, ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:

Aquatic toxicity;

120 ppm/24,48 & 96 hr/mosquito fish/TLm/fresh water — Reference (b) (converting bisulfite figure to metabisulfite basis).

OCTANOL/WATER PARTITION COEFFICIENT: ND

EPA HAZARDOUS SUBSTANCES (CLEAN WATER ACT SEC. 311): YES

IF SO REPORTABLE QUANTITY: 5000\$ (40 CFR 116-117) WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS): Neutralize with alkali and flush to sewer with plenty of water if permitted by applicable disposal regulations, Good ventilation is required during neutralization because of the release of SO2 gas. Oxidation to sodium sulfate solution is required prior to disposal. This may be done by adding a slight excess of dilute hydrogen peroxide carefully and with stirring. Neutralized or oxidized waste may have to be disposed of by an approved contractor.

RCRA STATUS OF UNUSED MATERIAL IF DISCARDED: Not a "hazardous waste". HAZARDOUS WASTE NUMBER: (IF APPLICABLE): (40 CFR 261)

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES:

Tip "Threshold Limit Values for Chemical Substances", ACOIH, 1987/88. REGULATORY STANDARDS:

FDA regulations apply to use of food and NF grades (21 CFR). Food use in meats or in food recognized as a source of vitamin B1 is prohibited (21 CFR 132.3766).

- D.O.T. CLASSIFICATION: ORM-B I.D. No. NA 2693 (49 CFR 173) GENERAL:
 - (a) ACCIH, Documentation of the Threshold Limit Values, 4th ED., 1981, -- Am. Conf. of Governmental Industrial Hygienists, Cincinnati 45202 s review for this material with 4 references.
 - (b) Coast Guard CHRIS system form covering Sodium Bisulfite and Metabisulfite, "SBS", October, 1978.

K. ADDITIONAL INFORMATION

This product is not for food or drug use unless material is labeled "food grade" or "NF grade," as applicable.

For food srade product, the following applies;

(1) Effective August 8, 1987, the F.D.A. has banned the use of "Sulfiting Agents" or "Sulfites" on fruits and vegetables intended to be served raw or sold raw to consumers.

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PRODUCT: SODIUM METABLSULFITE

ORDER NO: PROD NO :

- (2) Effective January 9, 1987, the F.D.A. is requiring when a sulfite is present in a detectable amount in a finished food, regardless of whether it has been directly or indirectly added via one or more of the food ingredients, it must be declared on the label. The regulation defines a "detectable amount" of sulfite to be 10 ppm.
- (3) Sulfiting agents or sulfites are not to be used on foods or meats recognized as source of Vitamin 81.

FOOTNOTE: NO = NOT DETERMINED NA = NOT APPLICABLE * = PROFRIETARY - TRADE SECRET ----- FOR ADDITIONAL INFORMATION -------

VW&R SPOKANE CONTACT: MSDS COORDINATOR

DURING BUSINESS HOURS, PACIFIC TIME

(204)889-3400

03/15/94 10:45 PRODUCT: CUST NO: ORDER NO:

NOTICE ----

** VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS OR 0.000

IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE,

WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN, **

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, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&RS 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 THE 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.

* * * ENDOFMSDS * * *

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10-0930

REPORT NUMBER: 703 MSDS NO: P21725VS UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 07/16/04

PAGE: 001

VERSION: 003

PRODUCT: POTASSIUM BROMIDE

ORDER NO: 226085

PROD NO : 614395

. PHOTOGRAPHERS FORMULARY CALL IN ADVANCE TO MEET 7079 HWY 83 N.

BOX 89

CONDON

MT 59826

UNIVAR USA INC. 6100 CARILLON POINT , KIRKLAND

(425)889-3400 . WA 98033

----- EMERGENCY ASSISTANCE ------

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC (800)424-9300

PRODUCT IDENTIFICATION

PRODUCT NAME:

POTASSIUM BROMIDE

MSDS NUMBER:

P21725VS

DATE ISSUED:

11/19/02

SUPERCEDES:

NEW

ISSUED BY:

006137

REVIEWED DATE:

07/16/2004

THIS MSDS HAS BEEN REVIEWED ON 07/16/2004, AND IS

CURRENT AS OF THE DATE ISSUED ABOVE.

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

CHEMICAL NAME

POTASSIUM BROMIDE

CHEMICAL FORMULA MOLECULAR WEIGHT KBR 120.98

TYPE OF PRODUCT AND USE

UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 07/16/04

PAGE: 002

VERSION: 003

PRODUCT: POTASSIUM BROMIDE

ORDER NO: 226085 PROD NO: 614395

FOR USE IN PHOTOGRAPHIC EMULSIONS AND DEVELOPING SOLUTIONS HEAT STABILIZER IN NYLON BROMINATING AGENT

COMPANY

BROMINE COMPOUNDS LTD.

P.O.B 180, BEER SHEVA 84101, ISRAEL

TEL +972-8-6297830

SUPPLIER

AMERIBROM, INC.

2115 LINWOOD AVENUE, FORT LEE, NEW JERSEY 07024-5004

USA TEL: 201 242 6560

EMERGENCY TELEPHONE CHEMTREC (800)424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

WEIGHT % ACGIH-TLV DATA OSHA (PEL) DATA COMPONENTS POTASSIUM BROMIDE 99.5 NOT DETERMINED NOT DETERMINED 7758-02-3

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW WHITE, ODOURLESS, CRYSTALLINE SOLID IRRITANT TO EYES

POTENTIAL HEALTH EFFECTS:

- EYE CONTACT IRRITANT
- SKIN CONTACT NOT IRRITANT TO INTACT SKIN, SLIGHTLY IRRITANT ON PROLONGED CONTACT TO ABRADED SKIN.
- INHALATION MAY CAUSE IRRITATION TO MUCOUS MEMBRANES AND UPPER RESPIRATORY
- INGESTION MAY CAUSE FALLING ASLEEP, MUSCULAR INCOORDINATION AND RESPIRATORY DEPRESSION.

ABDOMINAL PAIN, NAUSEA AND VOMITING.

4. FIRST-AID MEASURES

EYE CONTACT HOLDING THE EYELIDS APART, FLUSH EYES PROMPTLY WITH COPIOUS FLOWING WATER FOR AT LEAST 20 MINUTES.

GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH MILD SOAP AND PLENTY OF WATER FOR AT LEAST 15 MINUTES. WASH CLOTHING BEFORE RE-USE.

REPORT NUMBER: 703 UNIVAR USA INC. MSDS NO: P21725VS

MATERIAL SAFETY DATA SHEET

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PRODUCT: POTASSIUM BROMIDE

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GET MEDICAL ATTENTION IF IRRITATION OCCURS.

INHALATION IN CASE OF DUST INHALATION OR BREATHING FUMES RELEASED FROM HEATED MATERIAL, REMOVE PERSON TO FRESH AIR.

KEEP HIM QUIET AND WARM. APPLY ARTIFICIAL RESPIRATION IF NECESSARY AND GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION IF SWALLOWED, WASH MOUTH THOROUGHLY WITH PLENTY OF WATER AND GIVE WATER TO DRINK.

GET MEDICAL ATTENTION IMMEDIATELY.

NOTE: NEVER GIVE AN UNCONSCIOUS PERSON ANYTHING TO DRINK.

NOTES TO THE PHYSICIAN IN CASE OF INGESTION INDUCE VOMITING IN ALERT PATIENT. NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

5 FIRE-FIGHTING MEASURES

FLASH POINT NONE FLAMMABLE/EXPLOSION LIMITS NOT FLAMMABLE AUTO-IGNITION TEMPERATURE NOT APPLICABLE SUITABLE EXTINGUISHING MEDIA MATERIAL IS NOT COMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

FIRE FIGHTING PROCEDURE

COOL CONTAINERS WITH WATER SPRAY. IN CLOSED STORES, PROVIDE FIRE-FIGHTERS WITH SELF-CONTAINED BREATHING APPARATUS IN POSITIVE PRESSURE MODE.

UNUSUAL FIRE AND EXPLOSION

HAZARDS WILL DECOMPOSE FROM CA. 800 C RELEASING POISONOUS AND CORROSIVE FUMES OF HBR.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER GLOVES AND BOOTS.

METHODS FOR CLEANING UP SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL OR POSSIBLE RE-USE.

AVOID RAISING DUST.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

7. HANDLING AND STORAGE

UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

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ORDER NO: 226085 PROD NO: 614395

HANDLING AVOID BODILY CONTACT.
KEEP CONTAINERS TIGHTLY CLOSED.
STORAGE HYGROSCOPIC. AVOID EXPOSURE TO MOISTURE.
STORE IN A DRY, COOL, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS (SEE "MATERIALS TO AVOID").

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION REQUIREMENTS MECHANICAL EXHAUST REQUIRED.

VENTILATION MUST BE SUFFICIENT TO MAINTAIN TLV-TWA BELOW IO MG/M3 (ACGIH
RECOMMENDATION FOR PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED (PNOS)).

PERSONAL PROTECTIVE EQUIPMENT:

- RESPIRATORY PROTECTION DUST RESPIRATOR
- HAND PROTECTION PVC GLOVES RUBBER GLOVES
- EYE PROTECTION CHEMICAL SAFETY GOGGLES
- SKIN AND BODY PROTECTION BODY COVERING CLOTHES AND BOOTS HYGIENE MEASURES SAFETY SHOWER AND EYE BATH SHOULD BE PROVIDED. DO NOT EAT, DRINK OR SMOKE UNTIL AFTER-WORK SHOWERING AND CHANGING CLOTHES.
- 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE WHITE, ODOURLESS, CRYSTALLINE SOLID

MELTING POINT/RANGE 734 C

BOILING POINT/RANGE 1435 C

VAPOUR PRESSURE 1 MM HG AT 795 C

VAPOR DENSITY NOT APPLICABLE UNDER STANDARD CONDITIONS

EVAPORATION RATE (ETHER=1) NOT APPLICABLE UNDER STANDARD CONDITIONS

SOLUBILITY:

- SOLUBILITY IN WATER 65.5 G/100ML AT 20 C

102 GR/100ML AT 100 C

- SOLUBILITY IN OTHER SOLVENTS ALCOHOL: 0.142 G/I 00G AT 25 C

SPECIFIC GRAVITY 2.75

DECOMPOSITION TEMPERATURE FROM CA. 800 C

10. STABILITY AND REACTIVITY

STABILITY HYGROSCOPIC.

STABLE UNDER NORMAL CONDITIONS
MATERIALS TO AVOID STRONG OXIDANTS
STRONG ACIDS
HEAVY METAL SALTS
REACTS EXPLOSIVELY WITH BROMINE TRIFLUORIDE
CONDITIONS TO AVOID EXPOSURE TO MOISTURE
HEATING ABOVE DECOMPOSITION TEMPERATURE

UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

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PRODUCT: POTASSIUM BROMIDE

ORDER NO: 226085 PROD NO: 614395

HAZARDOUS DECOMPOSITION
PRODUCTS HBR
HAZARDOUS POLYMERIZATION WILL NOT OCCUR

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

- RAT ORAL LD50 > 5000 MG/KG
- EYE IRRITATION (RABBIT) IRRITANT
- DERMAL IRRITATION (RABBIT) NOT IRRITANT

CHRONIC TOXICITY REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.
REPEATED ORAL INTAKE OF BROMIDES (>9 MG/KG BODY WEIGHT/DAY) MAY AFFECT THE CENTRAL NERVOUS SYSTEM. WARNING SYMPTOMS INCLUDE MENTAL DULLNESS, SLURRED SPEECH, WEAKENED MEMORY, APATHY, ANOREXIA, CONSTIPATION, DROWSINESS AND LOSS OF SENSITIVITY TO TOUCH AND PAIN.

MUTAGENICITY NOT MUTAGENIC BY THE AMES TEST

CARCINOGENICITY NOT KNOWN TO BE A CARCINOGEN.
NOT CLASSIFIED BY IARC.
NOT INCLUDED IN NTP 9TH REPORT ON CARCINOGENS.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE KBR IS AN INORGANIC SALT, WHICH FULLY DISSOCIATES IN AQUATIC ENVIRONMENT TO BROMIDE AND POTASSIUM IONS. IT ALSO UNDERGOES DEGRADATION IN SOIL TO BROMIDE ION (NO FURTHER DEGRADATION OR BIODEGRADATION WILL OCCUR).

AQUATIC TOXICITY

- LC50, FISH 3200 MG/L, 5 DAYS (RAINBOW TROUT)
- -48 HOUR-EC50, DAPHNIA MAGNA >100 MG/I

AVIAN TOXICITY:

- ORAL LD50, BOBWHITE QUAIL >2500 MG/KG
- DIETARY LC50, BOBWHITE QUAIL 6000 PPM

BIOACCUMULATIVE POTENTIAL BIOACCUMULATION IS NOT LIKELY TO OCCUR SINCE THIS MATERIAL IS HIGHLY SOLUBLE IN WATER.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL ADD INTO A LARGE VESSEL CONTAINING WATER AND DRAIN INTO SEWER WITH AMPLE WATER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS WHEN DISPOSING OF THIS MATERIAL.

UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

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PRODUCT: POTASSIUM BROMIDE

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14. TRANSPORTATION INFORMATION

DOT NOT REGULATED

IMO NOT REGULATED

ICAO/IATA NOT REGULATED

15. REGULATORY INFORMATION

USA REPORTED IN THE EPA TSCA INVENTORY

CANADA LISTED IN DSL

EEC NO. 231-830-3 JAPAN LISTED IN MITI (1-108)

AUSTRALIA LISTED IN AICS

CHINA INVENTORY LISTED

SOUTH KOREA LISTED IN ECL (KE-29079)

SWITZERLAND GIFTKLASSE 3
PHILIPPINES LISTED IN PICCS

16. OTHER INFORMATION

THIS DATA SHEET CONTAINS CHANGES FROM THE PREVIOUS VERSION IN SECTION(S) 8,15

THE HSE POLICY OF DEAD SEA BROMINE GROUP
DEAD SEA BROMINE GROUP (DSBG) IS THE WORLD'S LARGEST PRODUCER OF ELEMENTAL
BROMINE AND A RECOGNIZED LEADER IN THE DEVELOPMENT AND SUPPLY OF BROMINE
COMPOUNDS

DSBG IS COMMITTED TO RESPONSIBLY MANAGE ITS PRODUCTS AT ALL STAGES OF THEIR LIFE CYCLE IN ORDER TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT. THIS RESPONSIBILITY APPLIES THROUGHOUT DEVELOPMENT, MANUFACTURE, TRANSPORTATION, USE, RECYCLE AND DISPOSAL OF DSBG PRODUCTS.

WITHIN THIS FRAMEWORK DSBG IS COMMITTED TO:

- * COMPLY WITH NATIONAL AND INTERNATIONAL REGULATORY REQUIREMENTS
- * CONFORM TO THE ISO 14001 AND OHSAS 18001 REQUIREMENTS FOR ENVIRONMENTAL AND OCCUPATIONAL HEALTH &SAFETY MANAGEMENT SYSTEMS AND PERIODICALLY EVALUATE PERFORMANCE AS PART OF THE COMPANY'S EXISTING QUALITY AUDITS SYSTEM
- * DESIGN PRODUCTS AND PROCESSES WHICH PREVENT RISK TO HEALTH AND THE ENVIRONMENT AT PRODUCTION SITES AND ALONG THE SUPPLY CHAIN
- * IMPROVE EFFICIENCY IN USE OF ENERGY & NATURAL RESOURCES, PROMOTE RECYCLING AND WASTE MANAGEMENT THROUGH SAFE & ENVIRONMENTALLY SOUND END OF LIFE

UNIVAR USA INC.

MATERIAL SAFETY DATA SHEET

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PROGRAMS

* WORK FOR CONTINUAL IMPROVEMENT IN HSE PERFORMANCE

- * REGULARLY ASSESS AND RESPONSIBLY MANAGE HEALTH, SAFETY AND ENVIRONMENTAL RISKS ASSOCIATED WITH PRODUCTS AND PROCESSES
- * EDUCATE AND TRAIN ALL MANAGERS AND EMPLOYEES TO IMPROVE THEIR HSE PERFORMANCE
- * DISTRIBUTE UPDATED INFORMATION CONCERNING ITS POLICY AND PRODUCTS TO ITS WORKERS, CUSTOMERS AND OTHER INTERESTED PARTIES THROUGH MATERIAL SAFETY DATA SHEET (MSDS), WORKERS' SAFETY SHEETS AND THROUGH THE DSBG INTERNET SITE
- * DEVELOP BUSINESS RELATIONSHIPS WITH RESPONSIBLE SUPPLIERS, TRANSPORTERS AND DISTRIBUTORS AND PROVIDE THEM WITH HSE SUPPORT, INFORMATION AND TRAINING
- * SUPPORT PRODUCT STEWARDSHIP PROGRAMS IN COOPERATION WITH CUSTOMERS, DISTRIBUTORS AND TRANSPORTERS
- * ALLOCATE THE NECESSARY RESOURCES FOR IMPLEMENTATION OF THIS POLICY

PREPARED BY HSE DIVISION IN ISRAEL

TELEPHONE: +/972-8-6297830

TELEFAX: +/972-8-6297832

WWW.DSBG.COM

END OF SAFETY DATA SHEET

REPORT NUMBER: 703 UNIVAR USA INC.
MSDS NO: P21725VS MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 07/16/04

PAGE: 008

VERSION: 003

PRODUCT: POTASSIUM BROMIDE

ORDER NO: 226.085 PROD NO : 614395

UNIVAR USA INC. CONTACT: MSDS COORDINATOR DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

10/28/04 08:52 PRODUCT: 614395 CUST NO: 113365 ORDER NO: 226085

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PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED

HEREIN, AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR

CONSEQUENTIAL DAMGAGES. **

DO NOT USE INGREDIENT INFORMATION AND/OR 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 UNIVARS 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.

10-1100

DEPORT NUMBER: 703 YSDS NO: 0270511

VAN WATERS & ROGERS INC.

MATERIAL SAFETY DATA SHEET

HAINFRAME UPLOAD DATE: 04/14/00

PAGE: 001

VERSION: 003

PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 PROD NO: 330190

PHOTOGRAPHERS FORMULARY CALL, IN ADVANCE TO MEET HC-31 BOX 89

30893 TM, CONDON

6100 CARILLON POINT , KIRKLAND

VAN WATERS & ROGERS INC. , A ROYAL VOPAK COMPANY (425)889-3400

, **UA 98**033

EMERGENCY ASSISTANCE

FOR ENERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMIREC (800)424-9300

PRODUCT NAME: PROPYLENE GLYCOL INDUSTRIAL

MSDS 4: DZ70511

EFFECTIVE DATE: 4/13/00

2. COMPOSITION/INFORMATION ON INGREDIENTS

PROPYLENE GLYCOL

CAS# 000057-55-6 99%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

* COLORLESS LIQUID. ODORLESS. TOXIC FUMES ARE RELEASED IN FIRE

* SITUATIONS.

POTENTIAL HEALTH EFFECTS (SEE SECTION 11 FOR TOXICOLOGICAL DATA.)

EYE: MAY CAUSE SLIGHT THANGTENT (TEMPORARY) EYE IRRITATION. COPYTAL TALLIFY IS LINLINGLY, MISTS HAY CYLEE EYE IRRITATION.

SKIN: PROLONGED CONTACT IS ESSENTIALLY NONIRRITATING TO SKIN. A STAGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN THE WATER-IAL PETAG ABSORBED THROUGH SKIN IN HARMFUL AMOUNTS. MEMEATED

REPORT NUMBER: 703 MSDS NO: DZ70511 VAN WATERS & ROCERS INC. MATERIAL SAFETY DATA SHEET

MAINERANE UPLOAD DATE: 04/14/00

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PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 PROD NO: 330190

EXPOSURES MAY CAUSE FLAKING AND SOFTENING OF SKIN. MAY BE ABSORBED IN POTENTIALLY HARMFUL AMOUNTS WHEN APPLIED IN LARGE QUANTITIES TO SEVERE BURNS (SECOND OR THIRD DEGREE) OVER LARGE AREAS OF THE BODY AS PART OF A CREAM OR OTHER TOPICAL APPLICATION, ABSORPTION UNDER SUCH CIRCUMSTANCES CAN ELEVATE SERUM OSMOLALITY AND MAY RESULT IN OSMOTIC SHOCK,

INGESTION: SINGLE DOSE ORAL TOXICITY IS CONSIDERED TO BE EXTREMELY LOW, NO HAZARDS ANTICIPATED FROM SWALLOWING SMALL ANDUNTS INCLDENTAL TO NORMAL HANDLING OPERATIONS.

INHALATION: AT ROOM TEMPERATURE, VAPORS ARE MINIMAL DUE TO PHYSICAL PROPERTIES. MISTS MAY CAUSE IRRITATION OF UPPER RESPIRATORY TRACT.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: REPEATED EXCESSIVE INCESTION MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS.

CANCER INFORMATION: DID NOT CAUSE CANCER IN LONG-TERM ANIMAL STUDIES.

TERATOLOGY (BIRTH DEFECTS): BIRTH DEFECTS ARE UNLIKELY. EXPO-SURES HAVING NO ADVERSE EFFECTS ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS.

REPRODUCTIVE EFFECTS: IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION.

4. FIRST AID

EYE: FLUSH EYES WITH PLENTY OF WATER.

SKIN: WASH OFF IN FLOWING WATER OR SHOWER.

INGESTION: NO ADVERSE EFFECTS ANTICIPATED BY THIS ROUTE OF EXPO-SURE INCIDENTAL TO PROPER INDUSTRIAL HANDLING.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT A PHYSICIAN.

NOTE TO PHYSICIAN: NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE.

TPEATMENT BASED ON JUDGMENT OF THE PHYSICIAN IN RESPONSE TO REACTIONS OF THE PATIENT.

TO FIRE FIGHTING MEASURES

FLAMMELE PROPERTIES
FLASH FOINT: 218F, 103C

LEPORT NUMBER: 703

VAN WATERS & ROGERS INC.

11505 NO: 0Z70511

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 04/14/00

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PAGE: 003

PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 PROD NO: 330190

METHOD LISED: PMCC

AUTOIGNITION TEMPERATURE: NOT DETERMINED

FLAMMABILITY LIMITS

LFL: 2.6% UFL: 12.5%

HAZARDOUS COMBUSTION PRODUCTS: DURING A FIRE, SMOKE MAY CONTAIN THE ORIGINAL MATERIAL IN ADDITION TO UNIOENTIFIED TOXIC AND/OR IRRITATING COMPOUNDS. HAZARDOUS COMBUSTION PRODUCTS MAY INCLUDE AND ARE NOT LIMITED TO: ALDEHYDES, CARBON MONOXIDE.

OTHER FLAMMABILITY INFORMATION: VIOLENT STEAM GENERATION OR ERUPTION MAY OCCUR UPON APPLICATION OF DIRECT WATER STREAM TO HOT LIQUIDS. SPILLS OF THESE ORGANIC LIQUIDS ON HOT FIBROUS INSULATIONS MAY LEAD TO LOWERING OF THE AUTOIGNITION TEMPERATURES POSSIBLY RESULTING IN SPONTANEOUS COMBUSTION.

EXTINGUISHING MEDIA: WATER FOG OR FINE SPRAY. CARBON DIOXIDE.

DRY CHEMICAL. FOAM. ALCOHOL RESISTANT FOAMS (ATC TYPE) ARE
PREFERRED IF AVAILABLE. GENERAL PURPOSE SYNTHETIC FOAMS
(INCLUDING AFFF) OR PROTEIN FOAMS MAY FUNCTION, BUT NUCH LESS
EFFECTIVELY. DO NOT USE DIRECT WATER STREAM. WILL SPREAD FIRE.

MEDIA TO BE AVOIDED: DO NOT USE DINECT WATER STREAM.

FIRE FIGHTING INSTRUCTIONS: KEEP PEOPLE AWAY, ISOLATE FIRE AREA AND DEMY UNNECESSARY ENTRY. BURYLING LIQUIDS MAY BE MOVED BY FLUSHING WITH WATER TO PROTECT PERSONNEL AND MINIMIZE PROPERTY DAYAGE. BURNING LIQUIDS MAY BE EXTINGUISHED BY DILUTION WITH WATER. OO NOT USE DIRECT WATER STREAM. MAY SPREAD FIRE.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: WEAR POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) AND PROTECTIVE FIRE FIGHTING CLOTHING (INCLUDES FIRE FIGHTING HELMET, COAT, PANTS, BOOTS, AND GLOVES). IF PROTECTIVE EQUIPMENT IS NOT AVAILABLE OR NOT USED, FIGHT FIRE FROM A PROTECTED LOCATION OR SAFE DISTANCE.

6. ACCIDENTAL RELEASE MEASURES (SEE SECTION 15 FOR REGULATORY

INFORMATION)

PROTECT PEOPLE: ISOLATE AREA.

PROTECT THE EAVIRONADIT: CONTAIN LIQUID TO PREVENT CONTAINMATION OF SOIL, SURFACE WATER OR GROUND WATER.

REPORT NUMBER: 703

VAN VATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

MSOS NO: 0ZZ70511 MATERIAL MAINERAME UPLOAD DATE: 04/14/00

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PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185336 PROD NO: 330190

CLEANUP: FOR SMALL SPILLS, CLEAN UP WITH ABSORBENT MATERIAL.
COLLECT MATERIAL IN SUITABLE AND PROPERLY LABELED OPEN CON-TAINERS. FOR LARGE SPILLS, DIKE AND PUMP INTO SUITABLE AND PROPERLY LABELED CONTAINERS.

7. HANDLING AND STORAGE

HANDLING: PRODUCT HANDLED HOT MAY REQUIRE ADDITIONAL VENTILATION OR LOCAL EXHAUST.

STORAGE: KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. STORE IN STAINLESS STEEL, ALLMINUM, PLASITE 3066 LINED CONTAINERS, OR 316 STAINLESS STEEL.

8, EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: PROVICE GENERAL AND/OR LOCAL EXHAUST VENTILATION TO CONTROL AIRBORNE LEVELS BELOW THE EXPOSURE GUIDELINES.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: LEE SAFETY GLASSES, SAFETY GLASSES SHOULD BE SUFFICIENT FOR MOST OPERATIONS; HOWEVER, FOR MISTY OPERATIONS WEAR CHEMICAL GOGGLES.

SKIN PROTECTION: USE GLOVES IMPERVIOUS TO THIS MATERIAL.

RESPIRATORY PROTECTION: ATMOSPHERIC LEVELS SHOULD BE MAINTAINED BELOW THE EXPOSURE GUIDELINE. WEN RESPIRATORY PROTECTION IS REQUIRED FOR CERTAIN OPERATIONS, USE AN APPROVED AIR-PURIFYING RESPIRATOR. IN MISTY ATMOSPHERES, USE AN APPROVED MIST RESPIRATOR.

EXPOSURE GUIDELINE(S): PROPYLEME GLYCOL: AIHA WEEL IN SO PPM TOTAL, 10 MG/N3 AEROSOL ONLY.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: COLORLESS LIQUID

ODOR: ODORLESS

VAPOR PRESSURE: 0.08 MM+G @ 200. 68F

VAPOR DENSITY: 2.62
FOILING POINT: 370F, 188C
SOLUBILITY IN WATER: COMPLETE
SPECIFIC GRAVITY: 1.088 20/20C, 68F

CEPORT NUMBER: 703 .305 NO: DZZV511 VAN WATERS & ROCERS INC.

MATERIAL SAFETY DATA SHEET

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FRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 PROD NO: 330190

CHEMICAL STABILITY: STABLE.

CONDITIONS TO AVOID: PRODUCT CAN DECOMPOSE AT ELEVATED TEMPERA-

INCOMPATIBILITY WITH OTHER MATERIALS: AVOID CONTACT WITH OXI-DIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN AVAILABLE OXYGEN IS
LIMITED, AS IN A FIRE OR WHEN HEATED TO VERY HIGH TEMPERATURES
BY HOT WIRE OR PLATE, CARBON MONOXIDE AND OTHER HAZARDOUS
COMPOUNDS SUCH AS ALDEHYDES MIGHT BE GENERATED.

HAZARBOUS POLYMERIZATION: WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION (SEE SECTION 3 FOR POTENTIAL HEALTH

EFFECTS, FOR DETAILED TOXICOLOGICAL DATA, WRITE OR CALL THE

ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

SKIN: THE LIEO FOR SKIN ABSORPTION IN RABBITS IS >10,000 MG/KG.

INGESTION: THE ORAL LUEO FOR RATS IS 20,000-34,000 MG/KG,

MUTACENICITY: IN VITRO MUTACENICITY STUDIES WERE NEGATIVE.
ANIMAL MUTACENICITY STUDIES WERE NEGATIVE.

12. ECOLOGICAL INFORMATION (FOR DETAILED ECOLOGICAL DATA, WRITE OR CALL

THE ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: BASED LARGELY OR COMPLETELY ON INFOR-MATION FOR SIMILAR MATERIAL(S), I.E. PROPYLENE GLYCOL, BIOCONCENTRATION POTENTIAL IS LOW (BOT LESS THAN 100 OR LOG POW LESS THAN 3). LOG OCTANOL/WATER PARTITION COEFFICIENT (LOG POW) IS -0.92. HENRY'S LAW CONSTANT (ID) IS 1.2E-8 ATH.M3/MOLE.

DEGRADATION & PERSISTENCE: DISED LARVELY OF COMPLETELY GN INFORMATION FOR SIMILAR MATERIAL(S), I.E. PROPYLENE GLYCOL, BIODEGRADATION UNDER AFROBIC STATIC LARDRATORY CONDITIONS IS HIGH (BODZO OR BODZS/THOD GREATER THAN 40X). BIODEGRA-DATION IS EXPECTED TO BE ACHIEVABLE IN A SECONDARY WASTE-WATER TREATMENT PLANT. 5-DAY BIOCHEMICAL DXYGEN DEMAND NEPORT NUMBER: 703 NEOS NO: DZ70511 VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET PAGE: 006

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PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 PROD NO: 330190

(8005) IS 1.16 P/P. 20-DAY BIOCHEMICAL DXYGEN DEMAND (80020) IS 1.45 P/P. THEORETICAL DXYGEN DEMAND (THOD) IS CALCULATED TO BE 1.68 P/P. INHIBITORY CONCENTRATION (ICSO) IN GECD ACTIVATED SLUGGE RESPIRATION INHIBITION TEST (GECD TEST NO. 207) IS GREATER THAN 1 GM/L. DEGRADATION IS EXPECTED IN THE ATMOSPHERIC ENVIRONMENT WITHIN MINUTES TO HOURS,

ECOTOXICITY: BASED LARGELY OR COMPLETELY ON INFORMATION FOR SIMILAR MATERIAL(S), I.E. PROPYLENE GLYCOL. MATERIAL IS PRACTICALLY NON-TOXIC TO AQUATIC ORGANISMS ON AN ACUTE BASIS (LCSO GREATER THAN 100 MG/L IN MOST SENSITIVE SPECIES).

ACUTE LCSO FOR FATHEAD MINATUA (PINEPHALES PROMELAS) IS 46500-54900 MG/L.

ACUTE LC50 FOR GUPPY (MCECILIA MCTICULATA) IS GREATER THAN 10000 MG/L.

ACUTE LC50 FOR WATER FLEA DAPHNIA MAGNA IS 4650-34400 MG/L. ACUTE LC50 FOR RAINBOW TROUT (ONCORHYNCHUS MYKISS) IS 44 ML/L (ABOUT 44000 MG/L).

13. DISPOSAL CONSIDERATIONS (SEE SECTION 15 FOR REGULATORY INFORMATION)

DISPOSAL: DO NOT DUMP INTO ANY SEVERS, ON THE GROUND, OR INTO ANY BODY OF WATER. ALL DISPOSAL METHODS MUST BE IN COMMISSIONE WITH ALL FEDERAL, STATE/PROVINCIAL AND LOCAL LAWS AND REGULATIONS.

REGULATIONS MAY VARY IN DIFFERENT LOCATIONS. WASTE CHARACTERIZATIONS AND COMMISSIONE WITH APPLICABLE LAWS ARE THE RESPONSIBILITY SOLELY OF THE WASTE GENERATOR. THE BOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANGLING OR USING THIS NATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MEDS SECTION 2 (COMPOSITION/INFORMATION ON INGREDIENTS).

FOR LINUSED & UNCONTAMINATED PRODUCT, THE PREFERRED OPTIONS IN-CLUDE SENDING TO A LICENSED, PERMITTED: RECYCLER, RECLAIMER, INCINERATOR, WASTE WATER TREATMENT SYSTEM.

AS A SERVICE TO ITS CUSTOMERS, DOW CAN PROVIDE NAMES OF INFORMATION RESOURCES TO HELP IDENTIFY WASTE MANAGEMENT COMPANIES AND OTHER FACILITIES WHICH RECYCLE, REPROCESS OR MANAGE CHEMICALS OR PLASTICS, AND THAT MANAGE USED DRUMS. TELEPHONE DOW'S CUSTOMER INFORMATION CENTER AT 800-258-2406 OR 517-002-1556 FOR FURTHER DETAILS.

CEPORT NUMBER: 703

VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET PAGE: 007

HBDS NO: 0Z70511

MAINFRAME UPLOAD DATE: 04/14/00

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PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 195534 PROD NO: 330190

DEPARTMENT OF TRANSPORTATION: THIS PRODUCT IS NOT REGULATED BY D.O.T. WHEN SHIPPED DOMESTICALLY BY LAND.

CANADIAN TOO INFORMATION: FOR TOO REGULATORY INFORMATION, IF REQUIRED, COMBULT TRANSPORTATION REGULATIONS, PRODUCT SHIPPING PAPERS, OR YOUR DOWNERPRESENTATIVE.

15. REGULATORY INFORMATION (NOT MEANT TO BE ALL-INCLUSIVE—SELECTED

REGULATIONS REPRESENTED)

MOTICE: THE INFORMATION HEREIN IS PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE AS OF THE EFFECTIVE DATE SHOWN ABOVE. 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, STATE OR PROVINCIAL, AND LOCAL LAWS. THE FOLLOWING SPECIFIC INFORMATION IS MADE FOR THE PURPOSE OF COMPLYING WITH NUMEROUS FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS AND REGULATIONS. SEE OTHER SECTIONS FOR HEALTH AND SAFETY INFORMATION.

SARA 313 INFORMATION: TO THE BEST OF OUR KNULLEIGE, THIS PRODUCT CONTAINS NO CHEMICAL SUBJECT TO SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION REQUIREMENTS.

SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REALTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

NOT TO HAVE MET ANY HAZARD CATEGORY

TOXIC SUBSTANCES CONTROL ACT (TSCA);

ALL INGREDIENTS ARE ON THE TSCA INVENTORY OR ARE NOT REQUIRED TO BE LISTED ON THE TSCA INVENTORY.

STATE RIGHT-TO-KNOW; THE FOLLOWING PRODUCT COMPONENTS ARE CITED ON ERTAIN STATE LISTS AS MENTIONED. MINI-LISTED COMPONENTS MAY BE SHOWN

REPORT NUMBER: 703 VAN WATERS & ROGERS INC. MATERIAL SAFETY DATA SHEET

PAGE: 008

MSDS NO: 0270511

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PRODUCT: PROPYLENE GLYCOL INDUSTRIAL

ORDER NO: 185536 FROD NO : 330190

IN THE COMPOSITION SECTION OF THE MSDS.

CHEMICAL NAME

CAS NUMBER LIST

1,2-PROPANEDIGL

000057-55-6 PAI PAI PA3

PAL=FEM/6YLVANIA HAZARDELE SUBSTANCE (PRESENT AT GREATER THAN OR EQUAL TO 1.0%).

OSHA HAZARO COMMUNICATION STANDARD:

THIS PRODUCT IS NOT A "HAZARDOUS CHEMICAL" AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

CANADIAN REGULATIONS

WHITS INFORMATION: THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (UHMIS) CLASSIFICATION FOR THIS PRODUCT IS:

THIS PRODUCT IS NOT A "CONTROLLED PRODUCT" UNDER WHYIS.

16. OTHER INFORMATION

REPORT NUMBER: 703 VAN WATERS & ROGERS INC. PAGE: 009 MSDS NO: DZZXX51.1 MATERIAL SAFETY DATA SHEET MAINFRANC UPLOAD DATE: 04/14/00 VERSION: 003 PRODUCT: PROPYLENE GLYCOL IMOUSTRIAL ORDER NO: 185536 PROD NO : 330190 FOR ADDITIONAL INFORMATION CONTACT: MSDS COORDINATOR VAN WATERS & ROBERS INC. BURING BUSINESS HOURS, PACIFIC TIME (425)889-2400 06/27/00 08:26 PRODUCT: 300190 CUST NO: 113365 ORDER NO: 185536 ATUE 4* VAN WATERS & ROGERS INC. ("VW&R"), A ROYAL VOPAK COMPANY, 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 CIRCINSTANCES BE LIABLE FOR INCIDENTAL OR

DO NOT USE INGREDIENT INFORMATION AND/OR 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 WAR SALES OFFICE.

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Material Safety Data Sheet

NFPA	HMIS	>	Personal Protective Equipment
	Health Hazard	(3)	
1 1	Fire Hazard	0	
	Reactivity	1	See Section 15.

Section 1. Chemical Pro-	duct and Company Identifi	cation					
Common Name/	Potassium carbon			Code	P4210		
Trade Name			1 <u></u>	CAS#	584-08-7		
Manufacturer	SPECTRUM CHEMIC	CAL MFG. CORP.		RTECS	TS7750000		
**************************************	14422 SOUTH SAN			TSCA	On the TSCA lis	t.	
	GARDENA, CALIFO		•				
Commercial Name(s)	Not available			CI#	Not available.		
Synonym	Not available.	Not available.			enc <u>y</u>		
Chemical Name	Not available.	Not available.			4hr) 800-424-9300	<u>)</u>	
Chemical Family	Not available.	Not available.			Emergency phone: (310) 516-8000		
Chemical Formula	K2CO3	K2C03					
Supplier	SPECTRUM QUALITY 14422 S. SAN PEDRO GARDENA, CA 90248-	STREET					
Section 2. Composition	n and Information on Ingre	dients	-				
				Exposure Limits			
Name		CAS#	TWA (mg/m3)	STEL (mg/m3)	CEIL (mg/m3)	% by Weigh	
Potassium carbonate	•••	584-08-7				100	

Toxicological Data
on Ingredients

Potassium carbonate:

ORAL (LD50):

Acute: 1870 mg/kg (Rat).

Section 3. Hazards Identification

Potential
Acute
Health

Extremely dangerous in case of skin contact (irritant), of eye contact (irritant). Very dangerous in case of skin contact (corrosive), of ingestion, of inhalation. Corrosive to eyes and skin. This product may irritate eyes and skin upon contact. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally,

to the section of the formal 2.

Bartrollogu 10 4

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Potential Chronic Extremely dangerous in case of skin contact (irritant), of eye contact (irritant). Very dangerous in case of skin contact (corrosive), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not

Health Effects available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. The substance is toxic to mucous membranes. Toxicity of the product to the reproductive system: Not available. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Section 4. First	Aid Measures	
	Check for and remove any contact lenses. DO NOT use an eye ointment. Seek medical attention.	
Eye Contact		
Contact		
	If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly	
Skin	and body Place in the protection your own hands and body. Place the victiff usual a deluge shower, it the	
Contact	shaming touches the victim's exposed skin, such as the hands, Gently and thoroughly wash the	
	crevices, creases and groin. Cover the distributed skin with an emollient. If irritation persists, seek	
	medical attention. Wash contaminated clothing before reusing.	
	Seek	
Hazardous	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek	
Skin	medical attention.	
Contact		
	en la companya de la	
	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.	
Inhalation		
	a No additional information.	
Hazardous	T No additional information.	
Inhalation		
-		
•		
Ingestion	Remove dentures if any. Have conscious person drink several glasses of water or milk. INDUCE	,
Ingestion	VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to ingest. Seek medical attention.	
	and throat. NEVER give an unconscious person anything to ingest. Occir modical according	
Hazardous	No additional information.	
Ingestion		
1 = 1	The second of th	
	and the second s	
	ভালেকজনত পুৰুষ্ট বুলালে ভালি ক্ৰিয়াল কৰিব কৰিব কৰিব কৰিব কৰিব কৰিব কৰিব কৰিব	
Turk (1) Turk	യുടു കുറി അക്രമ്മേ ആള് വാര്യ് (പ്രാവം) വാര്യ് വ അ ംഗ്യൂ ആരുന്നുള്ള ഇത് അ സ്വാഹ് വാര്യ്യ വാര്യ് വാര്	
900 t	rend Biggs (1988) in China a committe and the committee of the committee o	
•		

Flammability of the Product	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
grandings with his	AND THE RESERVE OF A STREET OF THE PROPERTY OF

Products of Combustion	Not applicable.
Fire Hazards in Presence of	Not applicable.
Various Substances	
Explosion in Presence of	Risks of explosion of the product in presence of mechanical impact: Not available.
Various Substances	Risks of explosion of the product in presence of static discharge: Not available. No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.
	the second secon
Fire Fighting Media	Non-flammable.
and Instructions	
Special Remarks	No additional remark.
on Fire Hazards	
Special Remarks	No additional remark.
on Explosion Hazards	

Small Spill

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill

Our database contains no additional information in case of a spill and/or a leak of the product. Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7. Handling and Storage

Precautions

DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label.

Avoid contact with skin and eyes. Keep away from incompatibles as acids, moisture.

Storage

No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls Use process enclosures, local exhaust ventilation, or other engeneering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

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Personal Protection Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves (impervious). Wear appropriate respirator when ventilation is inadequate.

Personal Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus

Protection in Case of a Large Spill sufficient; consult a specialist BEFORE handling this product.

Exposure Limits Not available.

Physical state	Solid. (Powdered solid.)	Odor	Odorless.
and appearance		Taste	Not available.
Molecular Weight	138.21	Color	White.
pH (1% soln/water)	Not available.		vviite.
Boiling Point	Decomposes.		
Melting Point	891.C (1635.8.F)		
Critical Temperature	Not available.		1000
Specific Gravity	2.29 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	Not available.		·
Volatility	Not available.		
Odor Threshold	Not available.		a de la companya de
Evaporation rate	Not available.		1.
Viscosity	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	Not available.		
Solubility	Not available.	-	·

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with Various Substances	Extremely reactive or incompatible with acids. Slightly reactive to reactive with moisture.
Corrosivity	Non-corrosive in presence of glass.
and the second s	
Special Remarks on Reactivity	No additional remark. See a company and the control of the property report report report report report reports and the property reports and the p
Special Remarks	No additional remark.

Ī	Section 11. Toxicological Informa	ition		
	Routes of Entry	Ingestion. Inhalation.	 त्रकोत्र कर्मा विक्रिकोत्तर कर्मा क्रुकोह्न क्रिके क्	16 .55 × 4

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of	Some metallic oxides.
Biodegradation	
Toxicity of the	The product itself and its products of degradation are not toxic.
Products of	
Biodegradation	
Special Remarks on	No additional remark.
the Products of	
Biodegradation	

Section 13. Disposal Considerations

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

 DOT Classification	Not a DOT controlled material (United States).	
But Buch	50 - 4/00 Feb 1.17 (
 Identification	Not applicable (PIN and PG).	
Special Provisions for Transport	Not applicable.	
 DOT (Pictograms)		
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Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312). Components present in this product at a level which could require reporting under the statute are:

NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual report release of toxic chemicals that appear in 40 CFR 372 (used for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are:

NONE

Pensylvania Right-To-Know, Hazardous substance List, Hazardous Substances and Special hazardous Substances on the list must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

NONE

Massachusetts Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

NONE

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal or greater than the reportable quantities (RQs) in 40 CFR 302.4. Components present in this product at a level which could require reporting under the statute are:

NONE

WARNING: This product contains a chemical known to the State of California to cause cancer. Chemical ingredient(s) requiring this warning:

NONE

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Chemical ingredient(s) requiring this warning: NONE

Other Classifications

WHMIS (Canada)

WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).

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DSCL (EEC) R22- Harmful if ingested.

R41- Risk of serious damage to eyes.

WHMIS (Canada) WHMIS CLASS D-2B: Material causing other Other Classifications toxic effects (TOXIC). R22- Harmful if ingested. DSCL (EEC) R41- Risk of serious damage to eyes. Health Hazard **National Fire Protection** HMIS (U.S.A.) Association (U.S.A.) Flammability Fire Hazard Reactivity Health Reactivity Personal Protection Specific hazard Personal Protective Equipment Protective Gloves (impervious). Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16. Other Information	on					
References	Not available.					
		•				;
•						
						•
Catalog Number(s)	P1235, P1236, P1237, P1238, P	1240, XX612				
Other Special	No additional remark.					
Considerations					· ·	
Validated by	E. Brull on 12/17/96.	Verified by	E. Brull.			
		Name				
Emergency Phone:	(310)516-8000					
Notice to Reader	All chemicals may pose unknow	n hazards and shoul	d he used w	ith caution	n This Material	
Tittle to Reader	Safety Data Sheet (MSDS) appl	ies only to the mater	ial as packaç	ged. If this	s product	
	is combined with other materials	s, deteriorates, or be-	comes conta	minated,	it may pose	-
	hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While					
	this MSDS is based on technical	il data judged to be r	eliable, Spec	strum Che	emical Mfg.	
. •	Corp. assumes no responsibility contained herein.	tor the completenes	ss or accurac	y or the r	monnauon	
	Contained Horonia					

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