AF-64

SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION

Product Identifier: AF-64

Manufacturer: Aquaserv, Inc.
570 N. Rivergate Rd.
Memphis, TN 38109

24 Hour Emergency Phone: **(901) 525-7701**
CHEMTREC: **(800) 424-9300**

Recommended use: Defoamer

SECTION 2 – HAZARDS IDENTIFICATION

Hazard Classification
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard's 29CFR 1910.1200 implementation of the Globally Harmonized System (GHS), i.e., material is not a dangerous substance or mixture requiring GHS classification according to the US GHS regulations.

Other hazards which do not result in classification

Advice: Repeated or prolonged exposure may cause slight irritation of eyes and skin.
Inhalation: Prolonged or excessive inhalation may cause coughing or sneezing. May cause irritation of the respiratory tract.
Ingestion: Low acute oral toxicity.
Chronic Exposure: No known carcinogenic or other chronic effects.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

SECTION 4 – FIRST AID MEASURES

Inhalation: If exposure by inhalation is suspected, immediately remove exposed individual to fresh air and provide oxygen. If not breathing, give artificial respiration. Get medical attention if cough or other symptoms develop.

Skin Contact: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.

Eye Contact: Immediately flush eyes with large amounts of water for a minimum of 15 minutes, while holding eyelids apart to ensure flushing of entire surface. If easy to do remove contact lenses. Do not let exposed individual rub eyes. Seek medical attention if symptoms persist.

Ingestion: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Contact Poison Control/physician immediately. Do not induce vomiting without medical advice.

Most Important Symptoms/Effects, Acute and Chronic: No severe effects after a single exposure.

Indication of Immediate Medical Attention and Special Treatment Needed: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Treat symptomatically.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: Use dry chemicals, foam, or carbon dioxide.

Unsuitable Extinguishing Media: Water may be ineffective.

Special Firefighting Procedures: Use self-contained breathing apparatus (SCBA) and proper personal protection clothing. Use NIOSH/MSHA approved respiratory protection.

Unusual Fire and Explosive Hazards: In the event of fire the product burns. Containers can build up pressure if exposed to heat (fire). Thermal decomposition products: Carbon oxides, hydrocarbons, fumes, smoke.

Further Information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Contaminated fire extinguishing water must be disposed of in accordance with local regulations. Cool containers/tanks with water spray.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Wear appropriate personal protective equipment. Evacuate nonessential personnel. Avoid contact with eyes and skin. Contaminated surfaces will be slippery.

Environmental Precautions: Avoid discharge into drains, water courses or onto the ground. Close or cap valves and /or block or plug hole in leaking container and transfer to another container. Must be disposed of in accordance with local and national regulations.

Spill or Leak Cleanup Procedures: In case of large spillage, contain by damming up. Collect by pump. Take up mechanically and collect into suitable containers for disposal. Must be disposed of in accordance with local and national regulations.

Small amounts: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). After cleaning, flush away traces with water.

Review each section of this SDS before responding to a spill or leak of this product. For detailed disposal information see section 13.

SECTION 7 - HANDLING AND STORAGE

Conditions for Safe Handling: Prevent eye and skin contact. Wash thoroughly with soap and water after handling. Ensure adequate ventilation. Keep away from combustible material.

Conditions for Safe Storage: Store in a place accessible by authorized persons only. Store at 5 – 40 °C (40 – 104 °F). Keep containers tightly closed in a cool, well-ventilated place. Avoid extreme temperatures.

Incompatible Materials: Strong oxidizing agents

Other Precautions: Eyewash and safety showers are recommended in the immediate work area. Check with your state OSHA to determine the need and maximum distance for stations to be placed in regards to possible chemical exposure.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits:

Components	CAS No.	Value	Form of Exposure	Control Parameters	Update	Basis
Distillates (petroleum)	64742-65-0	--	Mist	5 mg/m^3	--	--

Engineering Controls: Ensure adequate ventilation. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/Face Protection: Tightly fitting chemical safety goggles or safety glasses with side-shields are required.

Hand Protection: Chemical resistant gloves are required.

Skin Protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Respiratory Protection: Respiratory protection is not normally required. However, it may be necessary in areas of high vapor concentration or in areas with little or no ventilation. Always wear NIOSH approved respiratory protective equipment where there may be potential for airborne exposure.

General Work Practices: Eye wash fountains and safety showers in the work place are strongly recommended. Do not eat, drink, or smoke in areas where chemicals are being stored or handled. Wash thoroughly before handling food or beverages.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance	White liquid
Odor	Mild
Odor Threshold	Not determined
pH	Not determined
Melting Point/Range	Freezing point </= 32 °F
Initial Boiling Point and Boiling Range	>212 °F
Flash Point	>300 °F
Evaporation Rate (Butyl Acetate=1)	<1
Upper and Lower Explosion Limit	Not applicable
Vapor Pressure	Not determined
Relative Vapor Density	Not determined
Density	Ca. 7.7 lb/gal (77 °F)
Relative Density	Ca. 0.92 (25 °C)
Solubility	Dispersible
Partition Coefficient	Not determined
Auto-ignition Temperature	Not applicable
Decomposition Temperature	Not determined
Viscosity, Dynamic	> 600 cP (25 °C)
Viscosity, Kinematic	> 300 cP (40 °C)

NOTE: The above represents typical values and should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability: Stable under recommended storage conditions.

Reactivity: Stable under normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Keep away from sources of ignition.

Incompatible Materials: Oxidizing agents.

Hazardous Decomposition Products: In case of fire, hazardous decomposition products may be produced such as: Carbon oxides, hydrocarbons, fumes, smoke

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on Toxicological Effects
Acute Toxicity

Oral: No data available.

Dermal: No data is available on the product itself.

Mutagenicity: No data available.

Carcinogenicity: No known effect.

Sensitization: No data available.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Toxicity
LC50/48 h/ Pimephales promelas (fathead minnow)/Acute fish toxicity: 2000 mg/l

Toxicity to Other Organisms
No data available on the product itself.

Persistence and Degradability

Biological degradability
No data available on the product itself.

Bioaccumulative Potential
No data available on the product itself.
Partition coefficient: n-octanol/water: Not determined.

Mobility in Soil
Water solubility: dispersible.

Other Adverse Effects:
None known.

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal Procedure: Not an EPA hazardous waste. For product disposal and disposal of contaminated packaging, dispose of at a supervised incineration facility or an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal.

SECTION 14 - TRANSPORT INFORMATION

DOT: Not classified as dangerous in the meaning of transport regulations.

IMDG: Not classified as dangerous in the meaning of transport regulations.

IATA: Not classified as dangerous in the meaning of transport regulations.

SECTION 15 - REGULATORY INFORMATION

SARA Title III Section 311 Categories
Immediate (Acute) Health Effects: No
Delayed (Chronic) Health Effects: No
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactivity Hazard: No

SARA 313 – Specific Toxic Chemical Listing
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313

SARA 302 – Extremely Hazardous Substances
None present

US CERCLA – Comprehensive Environmental Response, Compensation and Liability Act List
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute. None present.

California Proposition 65
Remarks: This product does not contain any chemicals known to the state of California to cause cancer, birth defects or other reproduction harm.

United States TSCA Inventory (TSCA)
All components of this product are included in the United States TSCA Chemical Inventory or are not required to be listed on the United States TSCA Chemical Inventory.

Canada Domestic Substance List (DSL)
All components of this product are included in the Canada Domestic Substance List (DSL) or are not required to be listed on the Canada Domestic Substance List (DSL).

European Chemical Inventory (EINECS)
All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed.

Philippine Inventory Status (PICCS)
All components of this product are NOT included on the Philippine (PICCS).

Australian Inventory of Chemical Substances
All components of this product are NOT included in the Australian Inventory of Chemical Substances (AICS).

Japanese Inventory (ENCS)
All components of this product are NOT included on the Japanese (ENCS) inventory.

Korean Inventory (ECL)
All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

Chinese Inventory
All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

New Zealand Inventory (NZIoC)
All components of this product are not included on the New Zealand Inventory of Chemical Substances.

Taiwan Toxic Chemical Substances Control Act Inventory
This product's Taiwan Toxic Chemical Substances Control Act Inventory status has NOT been determined.

SECTION 16 – OTHER INFORMATION

Revision Date:	June 1, 2015
Date of Last Revision:	May 29, 2015
Revision Summary:	None
Prepared By:	Product Stewardship Team

HMIS Ratings:

HEALTH	**1**
FLAMMABILITY	**1**
REACTIVITY	**0**
PERSONAL PROTECTION	**-**

This Safety Data Sheet was prepared to comply with the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Aquaserv provides no warranties; either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. The data contained in this Safety Data Sheet reflects the latest information available to us on hazards, properties, and handling of this product under the recommended conditions of use. The information on this Safety Data Sheet relates only to the material as supplied and does not relate to combinations with other materials or processes.

CC 7430 Process Water Treatment-Scale Control

SECTION 1. IDENTIFICATION

Product Identifier	CC 7430 Process Water Treatment-Scale Control
Manufacturer	Control Chem Canada Ltd., 4460 Harvester Road, Burlington, Ontario, L7L 4X2, 905-319-2234, www.controlchem.com
Emergency Phone No.	CANUTEC, 613-996-6666 (*666 cell)
	Control Chem Canada Ltd., 1-866-882-2436
SDS No.	0392

SECTION 2. HAZARD IDENTIFICATION

Classified according to Canada's Hazardous Products Regulations (WHMIS 2015).

Classification

Corrosive to metals - Category 1; Acute toxicity (Oral) - Category 4; Skin corrosion - Category 1; Serious eye damage - Category 1; Skin sensitization - Category 1

Label Elements

Signal Word:
Danger
Hazard Statement(s):
May be corrosive to metals.
Harmful if swallowed or in contact with skin.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Precautionary Statement(s):
Prevention:
Keep only in original container.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash hands and skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
Response:
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTRE or doctor.
If skin irritation or rash occurs: Get medical advice or attention.

Wash contaminated clothing before reuse.
Absorb spillage to prevent material damage.

Storage:

Store in corrosion resistant container with a resistant inner liner.
Store locked up.

Disposal:

Dispose of contents and container in accordance with local, regional, national and international regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers	Other Names
Copolymer, Maleic Acid	113221-69-5	10.5-25.0		
Sodium hydroxide	1310-73-2	8.5-10.0		
1,2,4-Butanetricarboxylic acid, 2-phosphono-	37971-36-1	2.5-3.5		
Maleic acid	110-16-7	1.5-4.5		
Phosphonic acid, (((phosphonomethyl)imino)bis(2, 1-ethanediylnitrilobis(methylene))) tetrakis-,sodium salt	22042-96-2	1.5-3.0		
Potassium hydroxide	1310-58-3	3.0-7.5		

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Remove source of exposure or move to fresh air. Get medical advice or attention if you feel unwell or are concerned.

Skin Contact

Immediately and thoroughly flush with water for 15 minutes. Obtain medical attention immediately if irritation persists.

Eye Contact

Immediately and thoroughly flush eyes and under eyelids for at least 15 minutes. Seek medical attention immediately.

Ingestion

Do not induce vomiting. Rinse mouth with water. Call Poison Control Centre.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Dry chemical, water, carbon dioxide or foam. Use water to keep non-leaking, fire-exposed containers cool.

Unsuitable Extinguishing Media

None known.

Specific Hazards Arising from the Product

Closed containers may rupture violently when heated releasing contents.
In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide; corrosive phosphorous oxides. sodium oxides potassium oxides corrosive, oxidizing nitrogen oxides.

Special Protective Equipment and Precautions for Fire-fighters

Wear full protective equipment including a self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapours or gases. For a massive fire, immediately evacuate the area and use unmanned hose holder or

monitor nozzles. Dike and recover contaminated water for appropriate disposal.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Use the personal protective equipment recommended in Section 8 of this safety data sheet. Avoid breathing mist, vapours or gas.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway.

Methods and Materials for Containment and Cleaning Up

Stop or reduce leak if safe to do so. Contain and soak up spill with absorbent that does not react with spilled product. Contaminated absorbent poses the same hazard as the spilled product. Place used absorbent into suitable, covered, labelled containers for disposal. After cleaning, flush away traces with water.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Do not get in eyes, on skin or on clothing. Handle in accordance with good industrial hygiene and safety practices. Ensure eyewash and shower station are close by. Avoid generating vapours or mists. Only use where there is adequate ventilation.

Conditions for Safe Storage

Store in a cool, dry, well-ventilated location. Store in an area that is: separate from incompatible materials (see Section 10: Stability and Reactivity).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Sodium hydroxide	2 mg/m3		2 mg/m3			
1,2,4-Butanetricarboxylic acid, 2-phosphono-					10 mg/m3	
Potassium hydroxide	2 mg/m3			2 mg/m3		

Appropriate Engineering Controls

General ventilation is usually adequate. Use local exhaust ventilation, if general ventilation is not adequate to control amount in the air.

Individual Protection Measures

Eye/Face Protection

Wear safety glasses with side shield, face shield or goggles when handling.

Skin Protection

When handling, wear impervious gloves, apron, pants and jacket.

Respiratory Protection

Not normally required if product is used as directed.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Clear amber liquid.
Odour	Not available
Odour Threshold	Not available

pH	9.0 - 11.5
Melting Point/Freezing Point	Not available (melting); Not available (freezing)
Initial Boiling Point/Range	Not available
Flash Point	Not available
Evaporation Rate	Not available
Flammability (solid, gas)	Not applicable
Upper/Lower Flammability or Explosive Limit	Not available (upper); Not available (lower)
Vapour Pressure	Not available
Relative Density (water = 1)	1.15 - 1.30
Solubility	Very soluble in water
Partition Coefficient, n-Octanol/Water (Log Kow)	Not available
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
Viscosity	Not available (kinematic)

Other Information

Physical State Liquid

SECTION 10. STABILITY AND REACTIVITY

Reactivity

None known.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None expected under normal conditions of storage and use.

Conditions to Avoid

High temperatures. Freezing. Incompatible materials.

Incompatible Materials

Strong oxidizing agents (e.g. perchloric acid), halogenated compounds (e.g. trichloroethylene), strong acids (e.g. hydrochloric acid), strong reducing agents (e.g. hydrides).
Corrosive to: aluminum alloys.

Hazardous Decomposition Products

Very toxic carbon monoxide, carbon dioxide; corrosive phosphorous oxides. sodium oxides potassium oxides corrosive, oxidizing nitrogen oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Sodium hydroxide	Not available	340 mg/kg (rat)	1350 mg/kg (rabbit)
1,2,4-Butanetricarboxylic acid, 2-phosphono-	> 1.979 mg/L (rat) (vapour)	> 6500 mg/kg (rat)	> 4000 mg/kg (rat)
Maleic acid	Not available	708 mg/kg (rat)	1560 mg/kg (rabbit)
Potassium hydroxide	Not available	205 mg/kg (rat)	> 1260 mg/kg (rabbit)

LC50: No information was located.

LD50 (dermal): No information was located.

Skin Corrosion/Irritation

Corrosive based on information for closely related materials.

Serious Eye Damage/Irritation

May cause serious eye damage based on information for closely related materials.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

No information was located.

Skin Absorption

No information was located.

Ingestion

Harmful if swallowed. Based on information for closely related materials.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

No information was located.

Respiratory and/or Skin Sensitization

No information was located for respiratory sensitization. May cause an allergic reaction (skin sensitization) based on information for closely related chemicals. (Maleic acid)

Carcinogenicity

No information was located.

Reproductive Toxicity

Development of Offspring

No information was located.

Sexual Function and Fertility

No information was located.

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

May be harmful to aquatic life.

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Sodium hydroxide	45.4 mg/L (Oncorhynchus mykiss (rainbow trout); 96-hour; static)	265 mg/L (Daphnia magna (water flea); 48-hour)		
1,2,4-Butanetricarboxylic acid, 2-phosphono-	> 1000 mg/L (Oncorhynchus mykiss (rainbow trout); 96-hour)	1071 mg/L (Daphnia magna (water flea); 48-hour)	33.3-65.5 mg/L (72-hour)	
Potassium hydroxide	80 mg/L (96-hour)			

Persistence and Degradability

No information was located.

Bioaccumulative Potential

This product and its degradation products are not expected to bioaccumulate.

Mobility in Soil

If released into the environment, this product is expected to move rapidly through the soil, based on physical and chemical properties.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

All disposals must be made in accordance with applicable government regulations only. Under no conditions is any product to be released into the natural environment (ie. air, water, ground).

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	UN 1760	CORROSIVE LIQUID, N.O.S. (Sodium Hydroxide, Potassium Hydroxide)	8	III

Special Precautions Not applicable

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

None known.

SECTION 16. OTHER INFORMATION

Date of Preparation July 26, 2017

Date of Last Revision May 19, 2016

References Supplier Safety Data Sheet cHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Reptox eCHA-European Chemicals Agency.

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CC 7430 Traitement des Eaux de Process-Contrôle D'échelle

SECTION 1: IDENTIFICATION

Identificateur du produit	CC 7430 Traitement des Eaux de Process-Contrôle D'échelle
Fabricant	Control Chem Canada Ltd., 4460 Harvester Road, Burlington, Ontario, L7L 4X2, 905-319-2234, www.controlchem.com
Numéro de téléphone d'urgence	CANUTEC, 613-996-6666 (*666 cell) Control Chem Canada Ltd., 1-866-882-2436
Numéro de la FDS	0392

SECTION 2: IDENTIFICATION DES DANGERS

Classifié selon le Règlement sur les produits dangereux du Canada (SIMDUT 2015).

Classification

Matières corrosives pour les métaux - catégorie 1; Toxicité aiguë (orale) - catégorie 4; Corrosion cutanée - catégorie 1; Lésions oculaires graves - catégorie 1; Sensibilisation cutanée - catégorie 1

Éléments d'étiquetage

Mention d'avertissement :
Danger
Mention(s) de(s) danger(s) :
Peut être corrosif pour les métaux.
Nocif en cas d'ingestion ou de contact cutané.
Provoque de graves brûlures de la peau et de graves lésions des yeux.
Peut provoquer une allergie cutanée.
Conseil(s) de prudence :
Prévention :
Conserver uniquement dans le récipient d'origine.
Éviter de respirer les poussières/fumées/gaz/brouillards/vapeurs/aérosols.
Se laver soigneusement les mains et la peau après avoir manipulé.
Ne pas manger, boire ou fumer en manipulant ce produit.
Les vêtements de travail contaminés ne devraient pas sortir du lieu de travail.
Porter des gants de protection/des vêtements de protection/un équipement de protection des yeux/du visage.
Intervention :
EN CAS D'INGESTION : Rincer la bouche. Ne PAS faire vomir.
EN CAS D'INGESTION : Appeler un Centre antipoison ou un médecin en cas de malaise.
EN CAS DE CONTACT AVEC LA PEAU (ou les cheveux) : Enlever immédiatement les vêtements contaminés. Rincer la peau à l'eau/se doucher.
EN CAS D'INHALATION : Transporter la personne à l'extérieur et la maintenir dans une position où elle peut confortablement respirer.
EN CAS DE CONTACT AVEC LES YEUX : Rincer avec précaution à l'eau pendant plusieurs minutes. Enlever les

lentilles de contact si la victime en porte et si elles peuvent être facilement enlevées. Continuer à rincer.
Appeler immédiatement un Centre antipoison ou un médecin.
En cas d'irritation ou d'éruption cutanée: Demander un avis médical ou consulter un médecin.
Laver les vêtements contaminés avant réutilisation.
Absorber toute substance répandue pour éviter qu'elle attaque les matériaux environnants.

Stockage :

Stocker dans un récipient résistant à la corrosion avec doublure intérieure.
Garder sous clef.

Élimination :

Éliminer le contenu et le récipient conformément à la réglementation locale, régionale, nationale et internationale.

SECTION 3: COMPOSITION/INFORMATION SUR LES INGRÉDIENTS

Nom chimique	Numéro de CAS	%	Autres identificateurs	Autres noms
Copolymère d'acide maléique	113221-69-5	10.5-25.0		
Acide 1,2,4-butanetricarboxylique, acide 2-phosphono-	37971-36-1	2.5-3.5		
Hydroxyde de Sodium	1310-73-2	8.5-10.0		
Acide Maléique	110-16-7	1.5-4.5		
Acide phosphonique, (((phosphonométhyl) imino) bis (2, 1-éthanediylnitrilobis (méthylène))) tétrakis-, sel de sodium	22042-96-2	1.5-3.0		
L'hydroxyde de potassium	1310-58-3	3.0-7.5		

SECTION 4: PREMIERS SOINS

Mesures de premiers soins

Inhalation

Enlever la source d'exposition ou déplacer à l'air frais. Consulter un médecin si vous vous sentez mal ou si vous êtes inquiet.

Contact avec la peau

Rincer immédiatement et abondamment avec de l'eau pendant 15 minutes. Consulter un médecin si l'irritation persiste.

Contact avec les yeux

Immédiatement et soigneusement rincer les yeux et sous les paupières pendant au moins 15 minutes. Consulter immédiatement un médecin.

Ingestion

Ne pas faire vomir. Rincer la bouche avec de l'eau. Appelez le centre antipoison.

SECTION 5: MESURES À PRENDRE EN CAS D'INCENDIE

Agents extincteurs

Agents extincteurs appropriés

Produit chimique sec, eau, dioxyde de carbone ou mousse. Utiliser de l'eau pour refroidir les récipients exposés au feu qui ne fuient pas.

Agents extincteurs inappropriés

Aucun connu.

Dangers spécifiques du produit

Les récipients fermés peuvent se rompre violemment s'ils sont chauffés et peuvent alors libérer leur contenu.
Durant un incendie, les matières dangereuses suivantes peuvent être produites : monoxyde de carbone très toxique et

dioxyde de carbone; anhydrides phosphoriques corrosifs. oxydes de sodium potassium oxides oxydes de nitrogènes corrosifs et comburants.

Équipements de protection spéciaux et précautions spéciales pour les pompiers

Portez des vêtements protecteurs complets, y compris un appareil respiratoire individuel. Approcher l'incendie en amont afin d'éviter les vapeurs ou les gaz dangereux. Dans le cas d'un incendie de grande surface, évacuer immédiatement le secteur et utiliser une lance sur tourelle ou un support de lance télécommandé. Endiguer et recueillir l'eau contaminée afin de l'éliminer de façon appropriée.

SECTION 6: MESURES À PRENDRE EN CAS DE DÉVERSEMENT ACCIDENTEL

Précautions individuelles, équipements de protection et mesures d'urgence

Évacuer les lieux immédiatement. Isoler la zone de danger. Ne pas laisser entrer le personnel superflu ou non protégé. Utiliser l'équipement de protection individuel recommandé à la Section 8 de la présente fiche de données de sécurité. Éviter de respirer les brouillards, vapeurs ou gaz.

Précautions relatives à l'environnement

Empêcher la pénétration dans les égouts, le sol, ou les cours d'eau.

Méthodes et matériaux pour le confinement et le nettoyage

Colmater ou réduire la fuite s'il est sécuritaire de le faire. Contenir et absorber le déversement avec un absorbant qui ne réagit pas avec le produit déversé. L'absorbant contaminé présente le même risque que le produit déversé. Placer l'absorbant utilisé dans des récipients appropriés scellés et étiquetés en vue de leur élimination. Après le nettoyage, rincer les traces avec de l'eau.

SECTION 7: MANUTENTION ET STOCKAGE

Précautions relatives à la sûreté en matière de manutention

Éviter tout contact avec les yeux, la peau ou les vêtements. Manipuler conformément aux bonnes pratiques d'hygiène et de sécurité industrielles. Assurer une douche oculaire et d'une station d'eau sont à proximité. Éviter de produire de la vapeur ou des brouillards. N'utiliser qu'aux endroits où la ventilation est adéquate.

Conditions de sûreté en matière de stockage

Conservez dans un endroit frais , sec et bien ventilé. Stocker dans une zone ayant les caractéristiques suivantes : isolé des matériaux incompatibles (voir la Section 10 : Stabilité et réactivité).

SECTION 8: CONTRÔLE DE L'EXPOSITION/PROTECTION INDIVIDUELLE

Paramètres de contrôle

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Nom chimique	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Hydroxyde de Sodium	2 mg/m3		2 mg/m3			
Acide 1,2,4-butanetricarboxylique, acide 2-phosphono-					10 mg/m3	
L'hydroxyde de potassium	2 mg/m3			2 mg/m3		

Contrôles d'ingénierie appropriés

La ventilation générale est habituellement adéquate. Utiliser un système de ventilation par aspiration à la source, si la ventilation générale ne suffit pas à contrôler la quantité de produit dans l'air.

Mesures de protection individuelle

Protection des yeux et du visage

Porter des lunettes de sécurité avec protection latérale, un écran facial ou des lunettes lors de la manipulation.

Protection de la peau

Lors de la manipulation, porter des gants imperméables, tablier, pantalon et veste.

Protection des voies respiratoires

Habituellement non requis si le produit est utilisé selon les directives.

SECTION 9: PROPRIÉTÉS PHYSIQUES ET CHIMIQUES

Propriétés physiques et chimiques de base

Apparence	Liquide ambre claire.
Odeur	Pas disponible
Seuil olfactif	Pas disponible
pH	9.0 - 11.5
Point de fusion/Point de congélation	Pas disponible (fusion); Pas disponible (congélation)
Point initial d'ébullition et domaine d'ébullition	Pas disponible
Point d'éclair	Pas disponible
Taux d'évaporation	Pas disponible
Inflammabilité (solides et gaz)	Sans objet
Limites supérieures/inférieures d'Inflammabilité ou d'Explosibilité	Pas disponible (supérieure); Pas disponible (inférieure)
Tension de vapeur	Pas disponible
Densité relative (eau = 1)	1.15 - 1.30
Solubilité	Très soluble dans l'eau
Coéfficient de partage n-octanol/eau	Pas disponible
Température d'auto-inflammation	Pas disponible
Température de décomposition	Pas disponible
Viscosité	Pas disponible (cinématique)

Autres informations

État physique	Liquide

SECTION 10: STABILITÉ ET RÉACTIVITÉ

Réactivité

Inconnu.

Stabilité chimique

Habituellement stable.

Risque de réactions dangereuses

Aucun prévu dans les conditions normales de stockage et d'utilisation.

Conditions à éviter

Hautes températures. Congélation. Matières incompatibles.

Matériaux incompatibles

Agents oxydants forts (p. ex. acide perchlorique), composés halogénés (p. ex. trichloroéthylène), acides forts (p. ex. acide chlorhydrique), agents réducteurs forts (p. ex. hydrures).
Corrosif pour : alliages d'aluminium.

Produits de décomposition dangereux

Monoxyde de carbone très toxique et dioxyde de carbone; anhydrides phosphoriques corrosifs. oxydes de sodium oxydes de potassium oxydes d'azote.

SECTION 11: DONNÉES TOXICOLOGIQUES

Toxicité aiguë

Nom chimique	CL50	DL50 (orale)	DL50 (cutanée)
Hydroxyde de Sodium	Pas disponible	340 mg/kg (rat)	1350 mg/kg (lapin)
Acide 1,2, 4-butanetricarboxylique, acide 2-phosphono-	> 1.979 mg/L (rat) (vapeur)	> 6500 mg/kg (rat)	> 4000 mg/kg (rat)
Acide Maléique	Pas disponible	708 mg/kg (rat)	1560 mg/kg (lapin)
L'hydroxyde de potassium	Pas disponible	205 mg/kg (rat)	> 1260 mg/kg (lapin)

CL50: Aucun renseignement trouvé.

DL50 (cutanée): Aucun renseignement trouvé.

Corrosion/Irritation cutanée

Corrosif selon les renseignements relatifs à des matières très semblables.

Lésions oculaires graves/Irritation oculaire

Peut causer une grave affection oculaire selon les renseignements relatifs à des matières très semblables.

Toxicité pour certains organes cibles - Exposition unique

Inhalation

Aucun renseignement trouvé.

Absorption par la peau

Aucun renseignement trouvé.

Ingestion

Nocif en cas d'ingestion. Selon les renseignements relatifs à des produits chimiques très semblables.

Toxicité pour certains organes cibles - Expositions répétées

Aucun renseignement trouvé.

Sensibilisation respiratoire ou cutanée

Aucun renseignement n'a été trouvé concernant la sensibilisation des voies respiratoires. Peut causer une réaction allergique (sensibilisation de la peau) selon les renseignements relatifs à des produits chimiques très semblables. (Acide Maléique)

Cancérogénicité

Aucun renseignement n'a été trouvé.

Toxicité pour la reproduction

Développement de la progéniture

Aucun renseignement n'a été trouvé.

Fonction sexuelle et la fertilité

Aucun renseignement n'a été trouvé.

Effets sur ou via l'allaitement

Aucun renseignement n'a été trouvé.

Mutagénicité sur les cellules germinales

Aucun renseignement n'a été trouvé.

SECTION 12: DONNÉES ÉCOLOGIQUES

Écotoxicité

Peut être nocif pour la vie aquatique.

Dangers aigus pour le milieu aquatique

Nom chimique	CL50 pour les poissons	CE50 pour les crustacés	CEr50 pour les plantes aquatiques	CEr50 pour les algues

Hydroxyde de Sodium	45.4 mg/L (Oncorhynchus mykiss (truite arc-en-ciel); 96 heures; statique)	265 mg/L (Daphnia magna (puce d'eau); 48 heures)		
Acide 1,2, 4-butanetricarboxylique, acide 2-phosphono-	> 1000 mg/L (Oncorhynchus mykiss (truite arc-en-ciel); 96 heures)	1071 mg/L (Daphnia magna (puce d'eau); 48 heures)	33.3-65.5 mg/L (72 heures)	
L'hydroxyde de potassium	80 mg/L (96 heures)			

Persistance et dégradation

Aucun renseignement n'a été trouvé.

Potentiel de bioaccumulation

Ce produit et ses produits de dégradation ne devraient pas être bioaccumulables.

Mobilité dans le sol

S'il y a rejet dans l'environnement, ce produit devrait migrer rapidement à travers le sol, selon ses propriétés physiques et chimiques.

SECTION 13: DONNÉES SUR L'ÉLIMINATION

Les méthodes d'élimination

Toutes les cessions doivent être effectués conformément à la réglementation gouvernementale applicable uniquement. En aucun cas, tout produit à être libéré dans l'environnement naturel (p. Air, eau, sol).

SECTION 14: INFORMATIONS RELATIVES AU TRANSPORT

Réglementation	Numéro ONU	Désignation officielle de transport	Classe(s) de danger relative(s) au transport	Groupe d'emballage
Canadian TDG	UN 1760	LIQUIDE CORROSIF, N.S.A. (Hydroxyde de Sodium, Hydroxyde de Potassium)	8	III

Précautions spéciales Sans objet

Transport en vrac aux termes de l'annexe II de la Convention MARPOL 73/78 et du Recueil IBC

Sans objet

SECTION 15: INFORMATIONS SUR LA RÉGLEMENTATION

Réglementation relative à la sécurité, à la santé et à l'environnement

Aucun connu.

SECTION 16: AUTRES INFORMATIONS

Date de préparation le 26 juillet, 2017

Date de la plus récente version révisée le 19 mai, 2016

Références Fournisseur de données de sécurité base de données CHEMINFO. Centre canadien d'hygiène et de sécurité au travail (CCHST). Base de données HSDB®. National Library of Medicine des États-Unis. Accessible via le Centre canadien d'hygiène et de sécurité au travail (CCHST). Reptox eCHA-Agence européenne des produits chimiques.

Avis CETTE FICHE SIGNALÉTIQUE EST OFFERTE POUR VOTRE INFORMATION,

CONSIDÉRATION ET ENQUÊTE COMME REQUIS PAR LA LOI FÉDÉRALE SUR LES PRODUITS DANGEREUX ET TOUTES LÉGISLATION RELIÉS. LES INFORMATIONS SONT CONSIDÉRÉES COMME PRÉCISES, MAIS CONTROL CHEM CANADA LTÉE NE FOURNIT AUCUNES GARANTIES, EXPLICITES OU IMPLICITES. L'UTILISATEUR ASSUME TOUS LES RISQUES AUX PERSONNES, À LA PROPRIÉTÉ OU À L'ENVIRONNEMENT ASSOCIÉS À L'UTILISATION ADÉQUATE OU NON DE CE PRODUIT. TOUTES LES GARANTIES POUR CE PRODUIT SONT LIMITÉES AU REMPLACEMENT DE LA VALEUR DU PRODUIT.

SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY*

Product name: KATHON™ CF150 BIOCIDE

Issue Date: 04/01/2015
Print Date: 04/17/2015

THE DOW CHEMICAL COMPANY* encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: KATHON™ CF150 BIOCIDE

Recommended use of the chemical and restrictions on use
Identified uses: Biocidal product

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY*
Agent for Rohm and Haas Chemicals LLC
100 INDEPENDENCE MALL WEST
PHILADELPHIA PA 19106-2399
UNITED STATES

Customer Information Number: 215-592-3000
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1 800 424 9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.
Skin corrosion - Category 1B
Serious eye damage - Category 1
Skin sensitisation - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.

Precautionary statements

Prevention
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
If skin irritation or rash occurs: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Storage
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Aqueous solution of organic and inorganic compounds
This product is a mixture.

Component	CASRN	Concentration
5-Chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	>= 1.1 - <= 1.35 %

2-Methyl-4-isothiazolin-3-one	2682-20-4	>= 0.35 - <= 0.45 %
Magnesium Chloride	7786-30-3	>= 1.0 - <= 1.2 %
Magnesium nitrate	10377-60-3	>= 1.4 - <= 2.0 %
Water	7732-18-5	>= 95.0 - <= 96.0 %

4. FIRST AID MEASURES

Description of first aid measures
Inhalation: Move to fresh air. Give artificial respiration if breathing has stopped. If symptoms persist, call a physician.

Skin contact: IMMEDIATELY get under a safety shower. Remove contaminated clothing. Wash off with soap and water. Immediate medical attention is required. Wash contaminated clothing before re-use. Do not take clothing home to be laundered. Discard contaminated shoes, belts, and other articles made of leather.

Eye contact: Rinse immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Ingestion: Drink 1 or 2 glasses of water. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: MATERIAL IS CORROSIVE. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock and convulsions maybe necessary.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture
Hazardous combustion products: no data available

Unusual Fire and Explosion Hazards: Combustion generates toxic fumes of the following: hydrogen chloride Nitrogen oxides (NOx) sulfur oxides

Advice for firefighters
Fire Fighting Procedures: Cool containers/tanks with water spray. Minimize exposure. Do not breathe fumes. Contain run-off.

Special protective equipment for firefighters: Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Wear a NIOSH approved (or equivalent) respirator (with organic vapor/acid gas cartridge and a dust/mist filter) during spill clean-ups and deactivation of this material. MATERIAL IS CORROSIVE. Protective clothing, including chemical splash goggles, nitrile or butyl rubber full length gloves, rubber apron, or clothing made of nitrile or butyl rubber, and rubber overshoes must be worn during spill clean-ups and deactivation of this material. If material comes in contact with the skin during clean-up operations, IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. See SECTION 4, First Aid Measures, for further information.

Environmental precautions: Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods and materials for containment and cleaning up: WARNING: KEEP SPILLS AND CLEAN-UP RESIDUALS OUTOF MUNICIPAL SEWERS AND OPEN BODIES OF WATER. Adsorb the spill with spill pillows or inert solids such as clay or vermiculite, and transfer contaminated materials to suitable containers for disposal. Deactivate spill area with freshly prepared solution of 5% sodium bicarbonate and 5% sodium hypochlorite in water. Apply solution to the spill area at a ratio of 10 volumes deactivation solution per estimated volume of residual spill to deac tivate any residual active ingredient. Let stand for 30 minutes. Flush the spill area with copious amounts of water to chemical sewer (if in accordance with local procedures, permits and regulations). DO NOT add deactivation solution to the waste pail to deactivate the adsorbed material. See Section 13, “Disposal Considerations”, for information regarding the disposal of contained materials.

7. HANDLING AND STORAGE

Precautions for safe handling: This material is corrosive. For personal protection see section 8. Do not handle material near food, feed or drinking water.

Conditions for safe storage: Keep in a well-ventilated place. The product as supplied may evolve gas (largely carbon dioxide) slowly. To prevent the buildup of pressure the product is packaged in specially vented containers, where necessary. Keep this product in the original container when not in use. Container must be stored and transported in an upright position to prevent spilling the contents through the vent, where fitted. Do not store this material in containers made of the following: steel Do not store this material near food, feed or drinking water.
CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied. Expiration date based only on retention of >95% actives during storage at 20ºC-25ºC (68ºF-77ºF).

Storage stability
Storage temperature: 1 - 55 °C (34 - 131 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation

5-Chloro-2-methyl-4-isothiazolin-3-one	Rohm and Haas	TWA	0.076 mg/m3
	Rohm and Haas	STEL	0.23 mg/m3
2-Methyl-4-isothiazolin-3-one	Rohm and Haas	TWA	1.5 mg/m3
	Rohm and Haas	STEL	4.5 mg/m3

Exposure controls
Engineering controls: Use local exhaust ventilation with a minimum capture velocity of 150 ft/min. (0.75 m/sec.) at the point of dust or mist evolution. Refer to the current edition of "Industrial Ventilation: A Manual of Recommended Practice" published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Individual protection measures

Eye/face protection: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed.

Skin protection

Hand protection: Chemical-resistant gloves should be worn whenever this material is handled. The glove(s) listed below may provide protection against permeation. (Gloves of other chemically resistant materials may not provide adequate protection): Butyl-rubber. Nitrile rubber. PVC gloves >1 mm thickness Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Rinse and remove gloves immediately after use. Wash hands with soap and water. NOTE: Material is a possible skin sensitizer.

Other protection: Wear as appropriate: Chemical resistant apron complete suit protecting against chemicals

Respiratory protection: Typical use of this material does not result in workplace exposures that exceed the exposure limits listed in the Exposure Limit Information Section. For those special workplace conditions where the listed exposure limits are exceeded, a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. For concentrations up to 10 times the exposure limit, wear a properly fitted NIOSH approved (or equivalent) half-mask or full facepiece air purifying respirator equipped with organic vapor cartridges and N95 filters. If oil mist is present, use R95 or P95 filters. For those unlikely situations where exposure may greatly exceed the listed exposure limits (i.e. greater than 10-fold), or in any emergency situation, wear a properly fitted NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode or a full facepiece airline respirator in the pressure demand mode with emergency escape provision. See SECTION 6, Accidental Release Measures, for respirator and protective clothing requirements for spill clean-up and decontamination of this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	liquid
Color	Colorless to yellow
Odor	pungent
Odor Threshold	no data available

pH	2.0 - 4.0
Melting point/range	-3.00 °C (26.60 °F)
Freezing point	no data available
Boiling point (760 mmHg)	ca.100.00 °C (212.00 °F)
Flash point	Not applicable
Evaporation Rate (Butyl Acetate = 1)	<1.00
Flammability (solid, gas)	Not Applicable
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	no data available
Relative Vapor Density (air = 1)	ca.0.6200
Relative Density (water = 1)	1.0200
Water solubility	completely soluble
Partition coefficient: n-octanol/water	log Pow: 0.401 *Method Not Specified.*
Auto-ignition temperature	Not applicable
Decomposition temperature	no data available
Dynamic Viscosity	3.000 mPa.s at 25.00 °C (77.00 °F)
Kinematic Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	no data available
Molecular weight	no data available
Percent volatility	95.00 - 96.00 % Water

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: no data available

Possibility of hazardous reactions: Stable under recommended storage conditions.
Product will not undergo polymerization.

Conditions to avoid: no data available

Incompatible materials: Avoid contact with the following: Oxidizing agents Amines. Reducing agents. Mercaptans.

Hazardous decomposition products: Nitrogen oxides (NOx) Sulphur oxides hydrogen chloride

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity
LD50, Rat, female, 3,310 mg/kg
LD50, Rat, male, > 5,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, dust/mist, > 5 mg/l Estimated.

Skin corrosion/irritation
This material is corrosive.

Serious eye damage/eye irritation
Corrosive

Sensitization
Has caused allergic skin reactions when tested in guinea pigs.

Specific Target Organ Systemic Toxicity (Single Exposure)
Product test data not available.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Product test data not available.

Carcinogenicity
Did not cause cancer in laboratory animals.

Teratogenicity
Did not show teratogenic effects in animal experiments.

Reproductive toxicity
In animal studies, did not interfere with reproduction.

Mutagenicity
Not mutagenic when tested in bacterial or mammalian systems.

Aspiration Hazard
Product test data not available.

COMPONENTS INFLUENCING TOXICOLOGY:

5-Chloro-2-methyl-4-isothiazolin-3-one

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Aspiration Hazard
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

2-Methyl-4-isothiazolin-3-one

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Aspiration Hazard
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

Magnesium Chloride

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Magnesium nitrate

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
For similar material(s):
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

Carcinogenicity

Component	**List**	**Classification**
Magnesium nitrate	IARC	Group 2A: Probably carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

General Information
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity

5-Chloro-2-methyl-4-isothiazolin-3-one

Acute toxicity to fish
Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Rainbow trout (Oncorhynchus mykiss), 96 Hour, 0.19 mg/l, OECD Test Guideline 203 or Equivalent
LC50, Bluegill sunfish (Lepomis macrochirus), 96 Hour, 0.28 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna, 48 Hour, 0.16 mg/l

Acute toxicity to algae/aquatic plants
NOEC, Selenastrum capricornutum (green algae), Growth rate, 0.0099 mg/l
EC50, Algae (Selenastrum capricornutum), 72 Hour, Growth rate, 0.018 mg/l

Toxicity to bacteria
EC50, Bacteria, 16 Hour, 5.7 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 0.172000 mg/l
LOEC, Daphnia magna (Water flea), 21 d, number of offspring, 0.572000 mg/l

2-Methyl-4-isothiazolin-3-one

Acute toxicity to fish
Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 4.77 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), 48 Hour, 0.93 - 1.9 mg/l

Acute toxicity to algae/aquatic plants
EC50, Algae (Selenastrum capricornutum), 72 Hour, Growth rate, 0.158 mg/l, OECD Test Guideline 201

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna, 21 d, 0.04 mg/l

Magnesium Chloride

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Gambusia affinis (Mosquito fish), static test, 96 Hour, 16,500 mg/l, Method Not Specified.

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, 3,190 mg/l, Directive 84/449/EEC, C.2

Acute toxicity to algae/aquatic plants
EC50, alga Scenedesmus sp., 72 Hour, Biomass, 2,200 mg/l, OECD Test Guideline 201 or Equivalent

Magnesium nitrate

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
For similar material(s):
LC50, Poecilia reticulata (guppy), 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates
For similar material(s):
EC50, Daphnia magna, 48 Hour, > 100 mg/l

Acute toxicity to algae/aquatic plants
For similar material(s):
ErC50, Algae, 72 Hour, Growth rate, > 100 mg/l

Persistence and degradability

5-Chloro-2-methyl-4-isothiazolin-3-one
Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 98 %
Exposure time: 2 d
Method: OECD Test Guideline 302B or Equivalent

2-Methyl-4-isothiazolin-3-one
Biodegradability: Material is expected to be readily biodegradable.

Biodegradation: 98 %
Exposure time: 48 d
Method: Simulation study

Magnesium Chloride
Biodegradability: Biodegradation is not applicable.

Magnesium nitrate
Biodegradability: No relevant data found.

Bioaccumulative potential
Partition coefficient: n-octanol/water(log Pow): 0.401 Method Not Specified.

Mobility in soil

5-Chloro-2-methyl-4-isothiazolin-3-one

No relevant data found.

2-Methyl-4-isothiazolin-3-one

No relevant data found.

Magnesium Chloride

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 23.7

Magnesium nitrate

Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient(Koc): 24

13. DISPOSAL CONSIDERATIONS

Disposal methods: Incinerate liquid and contaminated solids in accordance with local, state, and federal regulations. (See 40 CFR 268)

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Corrosive liquid, acidic, organic, n.o.s.(5-Chloro-2-methyl-4-isothiazolin-3-one)
UN number	UN 3265
Class	8
Packing group	II

Classification for SEA transport (IMO-IMDG):

Proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(5-Chloro-2-methyl-4-isothiazolin-3-one)
UN number	UN 3265
Class	8
Packing group	II
Marine pollutant	5-Chloro-2-methyl-4-isothiazolin-3-one
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Corrosive liquid, acidic, organic, n.o.s.(5-Chloro-2-methyl-4-isothiazolin-3-one)
UN number	UN 3265
Class	8
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard
This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Acute Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains a chemical which is listed in Section 313 at or above de minimis concentrations. The following listed chemicals are present: (Quantity present is found elsewhere on this MSDS.)

Components	**CASRN**
Magnesium nitrate (10377-60-3) as nitrate compound	10377-60-3

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
This material is regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)and the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304. This material is or contains chemical(s) listed in 40 CFR Table 302.4 or nondesignated RCRA ICR substance(s). (Nondesignated ICR substances apply to materials that will not be reused.) The Reportable Quantity(s) (RQ) are listed below. Releases in excess of its reportable quantity must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.
D002, 100lbs.

Pennsylvania
Any material listed as “Not Hazardous” in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

United States TSCA Inventory (TSCA)
This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.
EPA Registration Number: 707-133

16. OTHER INFORMATION

Hazard Rating System
HMIS

Health	Flammability	Physical Hazard
3	0	0

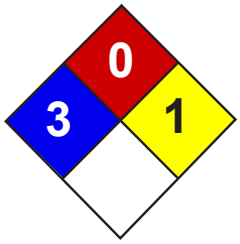
Revision
Identification Number: 101110573 / 1001 / Issue Date: 04/01/2015 / Version: 2.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

Rohm and Haas	Rohm and Haas OEL's
STEL	Short Term Exposure Limit (STEL):
TWA	Time Weighted Average (TWA):

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY* urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided 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 between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.



Material Safety Data Sheet
Calcium hypochlorite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Calcium hypochlorite

Catalog Codes: SLC3310, SLC5098, SLC5099

CAS#: 7778-54-3

RTECS: NH3485000

TSCA: TSCA 8(b) inventory: Calcium hypochlorite

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Ca(OCl)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Calcium hypochlorite	7778-54-3	100

Toxicological Data on Ingredients: Calcium hypochlorite: ORAL (LD50): Acute: 850 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Corrosive to eyes and skin. 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. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
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.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
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 Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

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: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Oxidizing material. Corrosive solid. Stop leak if without risk. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material.

Clean up spills in a manner that does not disperse dust into the air. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:
Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material Do not ingest. Do not breathe dust. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as reducing agents, combustible materials, organic materials, acids, moisture.

Storage:
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. Corrosive materials should be stored in a separate safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

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

Personal Protection:
Splash goggles. Lab coat. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 142.99 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: Decomposes.

Melting Point: 100°C (212°F)

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Soluble in cold water, hot 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: Reactive with reducing agents, combustible materials, organic materials, acids, moisture.

Corrosivity:
Extremely corrosive in presence of aluminum, of zinc. Corrosive in presence of steel, of copper. Slightly corrosive to corrosive in presence of glass, of stainless steel(304), of stainless steel(316).

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 850 mg/kg [Rat].

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (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.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 5.1: Oxidizing material.

Identification: : Calcium hypochlorite, dry : UN1748 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Calcium hypochlorite Massachusetts RTK: Calcium hypochlorite TSCA 8(b) inventory: Calcium hypochlorite CERCLA: Hazardous substances.: Calcium hypochlorite

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

Other Classifications:

WHMIS (Canada):
CLASS C: Oxidizing material. CLASS E: Corrosive solid.

DSCL (EEC):
R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection: j

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

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Lab coat. 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

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 11:31 AM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume

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Your Chemical Solutions
A Division of Appropriate Chemical International Ltd.

120 Stronach Crescent, London, ON, N5V 3A1
1-800-387-9799 or 519-451-1614
www.anchemsales.com

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Caustic Soda 30% CA500-30

SECTION 01: PRODUCT INFORMATION AND COMPANY INFORMATION

MANUFACTURER: Same as above
PREPARED BY: Production Department
VERSION DATE: 27-Jan-14
TELEPHONE NO.: (519) 451-1614
EMERGENCY PHONE NO.: (613) 996-6666
CHEMICAL FAMILY Not Available **CHEMICAL FORMULA** Not Applicable
MOLECULAR WEIGHT Not applicable **MATERIAL USE:** Please Refer to technical literature
SYNONYMS:

SECTION 02: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredients	Conc. Approx. %	C.A.S. #	LD/50 (RTE/SPEC)	LC/50 (RTE/SPEC)	TLV
Sodium Hydroxide	30%	1310-73-2	3000 mg/kg (Rat/oral)	N.Av.	N.Av.
Water	Balance	N.Av.	N.Av.	N.Av.	N.Av.

SECTION 03: HAZARD IDENTIFICATION

ROUTE OF ENTRY

Eyes: Very hazardous. (irritant) Liquid or spray mist may produce tissue damage on mucous membranes of eyes. Inflammation of the eye is characterized by redness, watering, and itching.

Skin: Extremely hazardous. (corrosive, irritant) Liquid or spray mist may produce tissue damage on mucous membranes of skin. Contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Inhalation Very hazardous. Liquid or spray mist may produce tissue damage on mucous membranes of respiratory tract. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe overexposure can result in death.

Ingestion: Very hazardous.

SECTION 04: FIRSTAID

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 30 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Get medical attention immediately.

Inhalation, Acute If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. If inhalation is accute, 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. Have conscious person drink several glasses of water or milk. Never give anything by mouth to an unconscious person. Seek medical attention.

Notes to physician: May cause tissue destruction/stricture. If lavage is performed, suggest endortracheal and/or esophageal control. Material is strong alkali. If burn is present, treat as any thermal burn, after decontamination. For burns of skin only. Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at the discretion of medical personnel. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

SECTION 05: FIRE EXPLOSION HAZARD AND FIRE FIGHTING MEASURES

FLAMMABLE?	No
IF YES, UNDER WHICH CONDITIONS?	
FLASH POINT (TCC) (C):	Not Applicable
FLAMMABLE LIMITS:	**LEL(% BY VOL.):** Not Applicable. **UEL(% BY VOL):** Not Applicable.
AUTO IGNITION TEMPERATURE (C)	Not Applicable.
EXTINGUISHING MEDIA	Use extinguishing media suitable for surrounding materials.
SPECIAL PROCEDURES:	Not Available
HAZARDOUS COMBUSTION PRODUCTS:	These products are nitrogen oxides (NO, NO2…)
UNUSUAL FIRE AND EXPLOSION HAZARDS	Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. This material does not burn.
SENSITIVITY TO STATIC DISCHARGE	Not Available
SENSITIVITY TO MECHANICAL IMPACT:	Not Available

SECTION 06: ACCIDENTAL RELEASE MEASURES

Leak and Spill Procedure: SMALL SPILL: Absorb with an inert material and place in an appropriate waste disposal container. If necessary, neutralize the residue with a dilute solution of acetic acid. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
LARGE SPILL: Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other not-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapour drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above the TLV. Check TLV on the MSDS and with local authorities.

SECTION 07: HANDLING AND STORAGE

Handling Procedures and Storage Requirements

Keep container dry. DO NOT ingest. Do not breath gas/fumes/vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from incompatibles such as metals, acids.
SPECIAL PRECAUTIONS FOR DILUTING CAUSTIC SODA SOLUTION:
1. ALWAYS add caustic soda solution to water with constant agitation. NEVER add water to the caustic soda solution.
2. The water should be lukewarm (80-100F). NEVER start with hot or cold water.
The addition fo caustic soda to liquid will cause a rise in themperature. If caustic soda becomes concentrated in one area, is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists, boiling or spattering which can cause an immediate VIOLENT ERUPTION.
Keep container tightly closed. Store above 16 C (60 F). Store in a dry and well-ventilated area.

SECTION 08: PERSONAL PROTECTIVE EQUIPMENT / EXPOSURE CONTROLS

GLOVES/TYPE:	Impervious chemical resistant gloves.
RESPIRATOR/TYPE:	A full face NIOSH/MSHA respirator with organic vapor cartridge.
EYE/TYPE:	Safety glasses. Face shield.
OTHER/TYPE:	Not Available
ENGINEERING CONTROL	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIE

PHYSICAL STATE/APPEARANCE: Liquid. (Clear to slightly hazy)

ODOUR:	Odorless.	**ODOUR THRESHOLD:**	N. Av.
VAPOUR PRESSURE (mm Hg @ 20C):	.2 (50%)	**VAPOUR DENSITY (Air=1):**	N. Av.
EVAPORATION RATE (Ether = 1):	N. Av.	**SPECIFIC GRAVITY:**	1..5 (50%)
BOILING POINT (C):	115-140 °C	**FREEZING POINT (C)**	1-12 °C
Ph (% SOLUTION):	14	**% VOLATILE (WT):**	0
SOLUBILITY IN WATER (% W/W)	Completely soluble.		

SECTION 10: STABILITY AND REACTIVITY

CHEMICALLY STABLE? Yes

IF NO, UNDER WHICH CONDITIONS? Heat is generated when mixed withwater. Spattering and boiling can occur. Avoid contact with halogenated organics, organic nitro compounds, glycols.

INCOMPATIBILITY WITH OTHER SUBTANCES Yes

IF YES, WITH WHICH ONES: Common metals and their alloys. Acids. Acid anhydrides. Oxidizable material. Contact with water causes an exothermic reaction.

SPECIAL REACTIVITY AND UNDER WHAT CONDITIONS Heat is generated when mixed withwater. Spattering and boiling can occur. Flammable hydrogen may be generated from contact with metals such as: aluminum, brass, tin, zinc. Avoid contact with acids, halogenated organics, organic nitro compounds, glycols. Caustic soda solution reacts readily with various reducing sugars (ie, fructose, glacatose, maltose, dry whey solids) to produce carbon monoxide.

HAZARDOUS DECOMPOSITION PRODUCTS: Not Available.

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL	N. Av.
LC 50 OF MATERIAL, SPECIES AND ROUTE	See Sec. 2
LD 50 OF MATERIAL, SPECIES AND ROUTE	See Sec. 2
CARCINOGENICITY OF MATERIAL	N. Av.
REPRODUCTIVE EFFECTS:	N. Av.
IRRITANCY OF MATERIAL	N. Av.
SENSITIZING CAPABILITY OF MATERIAL	N. Av.
SYNERGISTIC MATERIALS	N. Av.

SECTION 12: ECOLOGICAL INFORMATION

AQUATIC TOXICITY 180ppm/23hr/oysters/lethal/salt water pH 12.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

SECTION 14: TRANSPORT INFORMATION

TDG CLASSIFICATION Class 8, Sodium Hydroxide Solution

UN NUMBER: 1824

PACKING GROUP: II

Special Provisions for Transport

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION E

E CORROSIVE MATERIAL

SECTION 16: OTHER INFORMATION

ABBREVIATIONS USED: N.Av. = Not Available
N.App. / N.Ap. = Not Applicable

DISCLAIMER: Although the information herein is to the best of our knowledge accurate, no guarantee expressed or implied, is made regarding the information or the performance of any product. We assume no liability for incidental or direct damages of any kind, no matter what, including negligence.

SOURCES: Supplier MSDS

For updated copies of an MSDS, please contact Anchem Sales at the address/phone number on Page 1 or fax the MSDS Co-ordinator at (519) 451-4593.

LAST PAGE

Form 074 Revised Aug 2016

MATERIAL SAFETY DATA SHEET.

SECTION (1) PRODUCT IDENTIFICATION AND USE:

PRODUCT NAME: BAR COR CWS-55.

PRODUCT USE: CLOSED SYSTEM WATER TREATMENT.

WHMIS CLASSIFICATION: D2b.

SUPPLIERS NAME: PACE CHEMICALS LTD.
8321 WILLARD STREET,
BURNABY, B.C. V3N 2X3.

TELEPHONE: (604) 520-6211
FAX: (604) 521-5927

EMERGENCY PHONE,(Canutec): (613) 996-6666.

SECTION (2) HAZARDOUS INGREDIENTS:

Sodium Nitrite: 10-30%w/w CAS # 7632-00-0
LD50: (Oral,Rat): 85 mg/kg
LC50: (Rat, 4 Hrs) 1.45 mg/l

Sodium Borate: 3-7%w/w CAS # 7775-19-1
LD50: (Oral, Rabbit): 2330 mg/kg
LD50: (Dermal, Rabbit): >10000 mg/kg
LC50: No data available.

Sodium Mercaptobenzothiazole:
1-5%w/w CAS # 149-30-4
LD50: No data available.
LC50: No data available.

SECTION (3) PHYSICAL DATA:

Physical state:	Liquid.
Appearance:	Clear pale Yellow.
Odour:	Almost Odourless.
Odour threshold,(ppm):	No data available.
Vapour pressure,(mm Hg)	No data available.
Vapour density,(Air=1):	No data available.
Evaporation rate,(Butyl Acetate=1):	<1
Boiling point:	100°C Approx.
Freezing point:	No data available.
pH,(½ % soln):	9.6
Specific Gravity:	1.15
Water/oil distribution coefficient:	No data available.

SECTION (4) FIRE & EXPLOSION DATA:

Flammability: Yes ( ) No (X)
If yes under what conditions?
Means of extinction: As for surrounding fire.
Flash point & method: None. (tcc)
Flammability limits,(v/v in air): Upper: Not applicable.
Lower: Not applicable.
Auto ignition temperature,(°C): None known.
Hazardous combustion products: None.
Explosion data: Sensitivity to impact: None known.
Sensitivity to static discharge: None known.

SECTION (5) REACTIVITY DATA:

Chemical stability: No ( ) Yes (X)
If no, under what conditions?
Incompatibility with other substances: No ( ) Yes (X)
If yes, which ones? Acids.
Reactivity data: Stable (X) Unstable ( )
If unstable, Under which conditions?
Hazardous decomposition products: Oxides of Sulphur, Carbon & Nitrogen may be liberated on thermal decomposition. Acids may liberate oxides of nitrogen & Sulphur compounds.

SECTION (6) TOXICOLOGICAL PROPERTIES:

Route of entry: Skin contact (X) Skin absorption ( )
Eye contact (X) Inhalation (X) Ingestion (X)
Effects of acute exposure to product:

SKIN CONTACT: May cause irritation on prolonged contact.

EYE CONTACT: Irritant.

INHALATION: Mist may be irritating to the respiratory tract.

INGESTION: May cause irritation and nausea.

Effects of chronic exposure to product: No data available.
Exposure limits: No data available.
Irritancy of product: May be irritating to all parts of the body.
Sensitization to product: No data available.
Synergistic products: No data available.
Teratogenicity: No data available.
Reproductive toxicity: No data available.
Mutagenicity: Sodium nitrite has caused metagenetic effects in laboratory animals studies.
Carcinogenicity: The ingredients of this product are not considered to be carcinogens by the National Toxicity Program, the International Agency for Research on Cancer or the Occupational Safety and Health Administration.

SECTION (7) PREVENTIVE MEASURES:

Gloves:	PVC or Nitrile Rubber.
Respirator:	Not usually required.
Eye protection:	Chemical Goggles or Face Shield recommended.
Footwear:	No special requirements.
Clothing:	Impervious clothing (Rubber, PVC) recommended.
Other:	Eye wash station recommended.
Engineering controls:	Normal ventilation is adequate.
Leak & spill procedure:	Stop leak. Pick up spilled material with inert absorbent (Floor-Dry) & place in disposable container. Wash down floor.
Waste disposal procedure:	Dispose of in accordance with local municipal regulations.
Handling procedure & equipment:	No special requirements.
Storage requirements:	Store between 0° & 40°C. Keep container closed when not in use.

SPECIAL SHIPPING INSTRUCTIONS: NONE.

SECTION (8) FIRST AID MEASURES:

SKIN CONTACT:	Wash well with plenty of soap and water. If irritation develops contact a physician.
EYE CONTACT:	Immediately wash with plenty of running water, lifting eyelids occasionally. Contact a physician at once.
INHALATION:	Remove to fresh air. Contact a physician at once.
INGESTION:	If awake, Give plenty of water to drink & induce vomiting. Consult physician at once.

SECTION (9) PREPARATION DATA:

The information supplied in this data sheet is derived from sources believed to be reliable, however PACE CHEMICALS LTD offers no warranty, written or implied, as to the accuracy of its contents. We advise recipients to confirm in advance of need that the information is current, suitable and applicable to their requirements.

Prepared by : Technical Services
Telephone number : (604) 520-6211
Preparation date : October 14, 2014
Product number : 30055

SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY

Product name: AQUCAR™ DB 20 Water Treatment Microbiocide **Issue Date:** 03/24/2015
Print Date: 03/25/2015

THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: AQUCAR™ DB 20 Water Treatment Microbiocide

Recommended use of the chemical and restrictions on use
Identified uses:
COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2030 WILLARD H DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 800-424-9300
Local Emergency Contact: 989-636-4400

2. HAZARDS IDENTIFICATION

Hazard classification
This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.
Acute toxicity - Category 4 - Oral
Acute toxicity - Category 4 - Inhalation
Skin corrosion - Category 1
Serious eye damage - Category 1
Skin sensitisation - Sub-category 1B
Specific target organ toxicity - single exposure - Category 3

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Harmful if swallowed or if inhaled
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause drowsiness or dizziness.

Precautionary statements

Prevention
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/ physician.
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
If skin irritation or rash occurs: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
Toxic fumes may be released in fire situations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Polyethylene glycol	25322-68-3	>= 46.5 - <= 54.5 %
2,2-Dibromo-3-nitrilopropionamide	10222-01-2	20.0%
Dibromoacetonitrile	3252-43-5	<= 3.0 %
Sodium bromide	7647-15-6	<= 4.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly. Suitable emergency safety shower facility should be immediately available.

Eye contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Probable mucosal damage may contraindicate the use of gastric lavage. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen bromide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. Container may rupture from gas generation in a fire situation.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. If product becomes contaminated with water, monitor product for heat generation and/or decomposition. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Attempt to neutralize by adding materials such as Sodium bisulphite. Sodium metabisulfite. Neutralize with approximately 17.2 grams sodium bisulfite (NaHSO3) or 15.7 grams sodium meta

bisulphite (Na2S2O5) for every 100 grams biocidal product. Absorb with materials such as: Dirt. Sand. Vermiculite. Zorb-all®. Hazorb®. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Do not get in eyes, on skin, on clothing. Avoid breathing mist. Avoid prolonged or repeated contact with skin. Do not swallow. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in original container. Keep container tightly closed. Do not store in: Aluminum. Brass. Copper. Copper alloys. Mild steel. Stainless steel.

Storage stability
Shelf life: Use within 12 Month
Storage temperature: <= 35 °C (<= 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Polyethylene glycol	US WEEL	TWA aerosol	10 mg/m3
2,2-Dibromo-3-nitrilopropionamide	Dow IHG	C	2 mg/m3
Dibromoacetonitrile	Dow IHG	C	0.1 ppm
	Dow IHG	C	Absorbed via skin
Sodium bromide	Dow IHG	TWA	6 mg/m3

Exposure controls
Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Chlorinated polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Colorless to brown
Odor	Odorless to mild
Odor Threshold	No test data available
pH	1.5 - 5.0 *Literature*
Melting point/range	Not applicable
Freezing point	< -50 °C (< -58 °F) *Literature*
Boiling point (760 mmHg)	> 70 °C (> 158 °F) *Literature* Decomposition
Flash point	**closed cup** *Literature* none to 100°C (212 °F) **open cup** >= 182 °C (>= 360 °F) *Cleveland Open Cup*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not applicable to liquids
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	18.9 mmHg at 25 °C (77 °F) *Estimated.*
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.20 - 1.30 at 23 °C (73 °F) *Literature*
Water solubility	7.5 % at 20 °C (68 °F) *Literature*
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	20 cP at 25 °C (77 °F) (Brookfield Viscosity - @ 100 rpm, #0 spindle)
Kinematic Viscosity	16 cSt at 25 °C (77 °F) *Calculated.*
Explosive properties	no data available
Oxidizing properties	no data available

Molecular weight No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Avoid temperatures above 70°C (158°F) Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with: Oxidizers. Strong bases. Avoid contact with metals such as: Aluminum.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon dioxide. Bromine. Cyanogen bromide. Dibromoacetonitrile.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Swallowing may result in irritation or burns of the mouth, throat, and gastrointestinal tract. May cause dizziness and drowsiness.

LD50, Rat, 510 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, Rabbit, > 2,000 mg/kg

Acute inhalation toxicity
Mist may cause irritation of upper respiratory tract (nose and throat).

LC50, Rat, female, 4 Hour, dust/mist, 1.25 mg/l
LC50, Rat, male, 4 Hour, dust/mist, 1.40 mg/l

Skin corrosion/irritation
Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Sensitization
For similar material(s):
Has caused allergic skin reactions when tested in guinea pigs.
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:
No relevant information found.

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause drowsiness or dizziness.
Route of Exposure: Oral
Target Organs: Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Excessive exposure may increase the blood and tissue levels of bromine.
Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses

Carcinogenicity
Active ingredient did not cause cancer in laboratory animals. There is evidence that dibromoacetonitrile (DBAN), a possible degradation product of 2,2-dibromo-3-nitrilopropionamide (DBNPA), can produce cancer in laboratory animals. However, the relevance of this to humans is unknown.

Teratogenicity
For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity
No relevant data found.

Mutagenicity
For the active ingredient(s): In vitro genetic toxicity studies were negative. For the major component(s): Animal genetic toxicity studies were negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Carcinogenicity

Component	**List**	**Classification**
Dibromoacetonitrile	IARC	Group 2B: Possibly carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 3.6 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 2.5 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 1.5 mg/l

NOEC, Pseudokirchneriella subcapitata (green algae), Growth rate inhibition, 0.1 mg/l

Persistence and degradability

Polyethylene glycol
Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 85 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 1.67 mg/mg

2,2-Dibromo-3-nitrilopropionamide
Biodegradability: Abiotic degradation: The material is rapidly degradable by abiotic means.
10-day Window: Fail
Biodegradation: 35 - 78 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
10-day Window: Not applicable
Biodegradation: 83.3 %
Exposure time: 28 d
Method: OECD Test Guideline 303A or Equivalent
10-day Window: Not applicable
Biodegradation: 17 - 22 %
Exposure time: 28 d
Method: OECD Test Guideline 306 or Equivalent

Theoretical Oxygen Demand: 0.59 mg/mg

Chemical Oxygen Demand: 0.26 mg/mg

Stability in Water (1/2-life)
Hydrolysis, half-life, 65 hrs, pH 7

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 5.3 d
Method: Estimated.

Dibromoacetonitrile
Biodegradability: No relevant data found.

Theoretical Oxygen Demand: 0.48 mg/mg

Sodium bromide
Biodegradability: Biodegradation is not applicable.

Bioaccumulative potential

Polyethylene glycol
Bioaccumulation: No relevant data found.

2,2-Dibromo-3-nitrilopropionamide
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.79 Measured
Bioconcentration factor (BCF): 13 Fish. Measured

Dibromoacetonitrile
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.56 Measured

Sodium bromide
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Bioconcentration factor (BCF): < 40 Fish. Measured

Mobility in soil

Polyethylene glycol
No relevant data found.

2,2-Dibromo-3-nitrilopropionamide
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 15 Estimated.

Dibromoacetonitrile
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 13 Estimated.

Sodium bromide
No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Corrosive liquid, acidic, organic, n.o.s.(2,2-Dibromo-3-nitrilopropionamide)
UN number	UN 3265
Class	8
Packing group	III

Classification for SEA transport (IMO-IMDG):

Proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(2,2-Dibromo-3-nitrilopropionamide)
UN number	UN 3265
Class	8
Packing group	III
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Corrosive liquid, acidic, organic, n.o.s.(2,2-Dibromo-3-nitrilopropionamide)
UN number	UN 3265
Class	8
Packing group	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Acute Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Worker and Community Right-To-Know Act:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances knownto the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)
This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act
EPA Registration Number: 464-426
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

DANGER

Corrosive
Causes irreversible eye damage
May be fatal if swallowed.
Causes skin irritation
Harmful if inhaled or absorbed through skin
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.
This product is toxic to fish and invertebrates.

16. OTHER INFORMATION

Revision
Identification Number: 101189115 / A001 / Issue Date: 03/24/2015 / Version: 15.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

Absorbed via skin	Absorbed via skin
C	Ceiling limit
Dow IHG	Dow Industrial Hygiene Guideline
TWA	8-hr TWA
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided 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 between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

RoClean L211
SAFETY DATA SHEET

1. Company and Product Identification

1.1	Identification – Product Name:	**RoClean L211**
1.2	Other means of identification Synonym:	Organic Amine salt Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use:	Reverse osmosis membrane cleaner Use only as directed on the label.
1.4	Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	**AVISTA TECHNOLOGIES** 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
	Competent Person email address	klindsey@avistatech.com
1.5	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-202-483-7616 (International Collect)

DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NSF INTERNATIONAL TO ANSI/NSF 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE OFF-LINE IN REVERSE OSMOSIS SYSTEMS.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: *This product is a clear, colorless to amber colored, corrosive solution with a light, disinfectant odor. Depending on the duration of contact, over-exposures can severely irritate the skin or eyes and respiratory system, or cause burns. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. carbon monoxide, carbon dioxide, oxides of nitrogen and sodium). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.*

Physical Hazards Summary	None
Potential Health Hazards Summary	Eye Irritant, Category 2A Acute toxicity, oral, Category 3 Acute toxicity, dermal, Category 3 Skin sensitizer, Category 1
Potential Ecological Effects Summary	None

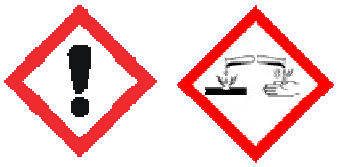
2.1 Classification Of Product

U.S. OSHA classification	Corrosive, Skin, eye irritant, sensitizer
Classification as per EC 1272/2008 (CLP/GHS)	Eye Irritant, Category 2A Acute toxicity, oral, Category 3 Acute toxicity, dermal, Category 3 Skin sensitizer, Category 1 Xi Irritant
WHMIS classification	E, corrosive

Hazardous Materials Information System (HMIS) Rating

Health	**3**
Flammability	**0**
Physical Hazard	**0**
Protective Equipment	**D**

2.2 Label Elements OSHA/GHS

General Warnings	P101	If medical advice is needed, have product container or label at hand.
	P102	Keep out of reach of children.
	P103	Read label before use
	P403	Store in a well-ventilated place.
	P233	Keep container tightly closed
Signal Word	WARNING!	
Hazard statements	H319	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P305 + P351 + P338	
	H317	May cause an allergic skin reaction
	H 312	Harmful in contact with skin
	H332	Harmful if inhaled
	H314	Causes severe skin burns and eye damage
Precautionary statements	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P305	IF IN EYES: rinse extensively with large amounts of water
	P351	Rinse cautiously with water for several minutes.
	P338	Remove contact lenses, if present and easy to do. Continue rinsing.
	P310	F INGESTED or INHALED Immediately call a POISON CENTER or doctor/physician.
Hazard pictograms		

2.3 Unclassified Hazards None

2.4 Ingredients with unknown acute toxicity None

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical name **CAS #** **EINECS #**	**% w/w**	**US OSHA**	**GHS/EU CLP**	**WHMIS**
Chelate Agent Proprietary Proprietary	20 - 30	Irritant	Eye Irritant, Category 2A H319 P305 + P351 + P338	Class D2B: Toxic Material at > 1% 
Organic Amine Proprietary Proprietary	20 - 30	Corrosive, Combustible liquid	Skin sensitizer, Category 1 Acute toxicity, oral, Category 3 H317 Acute toxicity, dermal, Category 3	B3 Combustible E Corrosive
Glycol Wetting Agent Proprietary Proprietary	1 - 5	Low hazard	Not regulated	Not regulated
Chelate Agent 2 Proprietary Proprietary	1 - 5	Toxic	Acute toxicity, oral, Category 3 Acute toxicity, dermal, Category 3	D2B Other toxic effects
Surfactant Proprietary Proprietary	1 - 5	Corrosive, Combustible liquid	Skin sensitizer, Category 1 Acute toxicity, oral, Category 3 Acute toxicity, oral, Category 3	B3 Combustible E Corrosive

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

4. FIRST-AID MEASURES

4.1 Description of Necessary Measures

Skin exposure: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

Eye exposure: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

Inhalation: If mist of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

4.2 Most Important Symptoms/Effects: Immediate: Inhalation exposure may cause coughing or sneezing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.

Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.

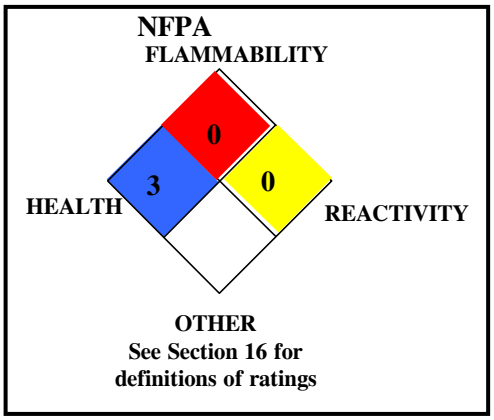
4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, **TARGET ORGANS:** Acute: Skin, eyes, respiratory system. Chronic: Skin, eyes, respiratory system

If Necessary:

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

5. FIRE-FIGHTING MEASURES

Flammable properties — Non-flammable aqueous solution



Flash Point °C: Not applicable.

Autoignition Temperature °C: Not applicable.

Flammable Limits (in air by volume, %):
Upper: Not applicable.
Lower: Not applicable.

5.1 Suitable And Unsuitable Extinguishing Media: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water spray	YES	Carbon dioxide	YES
Foam	YES	Dry chemical	YES
Halon	YES	Other	YES

5.2 Specific Hazards Arising From Chemical: When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and nitrogen oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.
Explosion Sensitivity to Static Discharge: Not applicable.

5.3 Special Protective Equipment And Precautions For Fire-Fighters: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people.

Protective equipment: For small releases (< 20 L), clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incidental releases (more than 20 L) should be Level C: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and full-face respirator with Amine and HEPA filter.

Emergency procedures: Monitoring must indicate that exposure levels are below those provided in Section 8 (Exposure Controls-Personal Protection) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained

Breathing Apparatus.

6.2 Methods and Materials for Containment and Cleaning Up

Vacuum or soak- up solids liquid for recovery/disposal. Neutralize residue with citric acid or other neutralizing agent for dilute amines. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable plastic container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

7.1 Precautions for Safe Handling

All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care.

As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating dust of this product. Remove contaminated clothing immediately.

During equipment maintenance follow practices indicated in Section 6 (Accidental Release Measures) to decontaminate equipment or clean-up small spills. Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate local standards.

7.2 Conditions For Safe Storage

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

Incompatibilities: Strong acids, oxidizers

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

8.1 Control Parameters

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLVs		OSHA-PELs			OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Chelate Agent	Proprietary	20 - 30	NE	NE	NE	NE	NE	NE
Organic Amine	Proprietary	20 - 30	7.5	15	8	15	30 ppm	NIOSH RELs: TWA = 8 STEL = 15 DFG MAKs: TWA = 5.1 PEAK = 2 MAK, 5 minutes, momentary value (Danger of cutaneous absorption) MAK Pregnancy Risk Group Classification: C
Glycol Wetting Agent	Proprietary	1 - 5	NE	NE	NE	NE	NE	NE
Chelate Agent 2	Proprietary	1 - 5	NE	NE	NE	NE	NE	NE
Surfactant	Proprietary	1 - 5	NE	NE	NE	NE	NE	NE
Water and other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentration present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

8.2 Appropriate Engineering Controls.

Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section or as low as reasonably achievable. Ensure

eyewash/safety shower stations are available near areas where this product is used.

8.3 Personal Protective Equipment

Respiratory protection:	None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists or vapor. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the applicable local standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full-face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).
Eye protection:	Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.
Hand protection:	Wear chemical impervious gloves (e.g., Solvex™, Neoprene).
Body protection:	If needed, use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance	This product is a clear, colorless to amber-colored liquid.		
Odor	Light disinfectant odor	Odor Threshold	NE
Freezing Point ^{o}C	< 0	pH (2% solution at 25^{o}C)	10.5 – 11.5
Initial Boiling Point ^{o}C	> 100	Boiling Point Range ^{o}C	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	Similar to water
Vapor Density (air = 1)	N/A	Vapor Pressure mm Hg @ 20°C:	18 - 20
Solubility (in water)	Soluble	Relative density (water = 1)	1.07 ± 0.1
Viscosity	Similar to water	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	NE		
How To Detect This Substance (Warning Properties):	Litmus paper will turn blue in contact with solutions of this solid.		

10. STABILITY and REACTIVITY

10.1	Reactivity	Not considered reactive.
10.2	Chemical Stability	Stable
10.3	Possibility of hazardous reactions	Hazardous polymerization will not occur.
10.4	Conditions to avoid	Avoid mixing with incompatible materials.
10.5	Incompatible Materials	Strong acids, oxidizers
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate nitrogen oxides, carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Toxicity data for hazardous ingredients	Oral LD_{50} mg/kg	Dermal LD_{50} mg/kg	Inhalation LD_{50} mg/kg
Chelate Agent	LD_{50} (Intraperitoneal-Rat) 1548 mg/kg: Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or function of salivary glands	N/A	N/A
	Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects Standard Draize Test (Eye -Rabbit, adult) 1900 mg Standard Draize Test (Eye-Rabbit, adult) 100 mg/24 hours: Moderate irritation effects		
Organic Amine	LD_{50} (Oral-Rat) 1720 mg/kg LD_{50} (Oral-Mouse) 700 mg/kg: Behavioral: somnolence (general depressed activity); Behavioral: muscle contraction or spasticity;	LD_{50} (Subcutaneous-Rat) 1500 mg/kg LD_{50} (Skin-Rabbit) 1 mL/kg LD_{50} (Subcutaneous-Rat) 1500 mg/kg LD_{50} (Skin-Rabbit) 1 mL/kg	LC (Inhalation-Mouse) > 2420 mg/m^3/2 hours LC (Inhalation-Cat) > 2420 mg/m^3/2 hours TCLo (Inhalation-Rat) 66 ppm/24 hours/30 days-

	Lungs, Thorax, or Respiration: dyspnea LD_{50} (Oral-Rabbit) 1 gm/kg LD_{50} (Oral-Guinea Pig) 620 mg/kg LD_{50} (Intraperitoneal-Rat) 67 mg/kg LD_{50} (Intraperitoneal-Mouse) 50 mg/kg LD_{50} (Intravenous-Rat) 225 mg/kg: Behavioral: somnolence (general depressed activity), muscle contraction or spasticity; Lungs, Thorax, or Respiration: dyspnea LD_{50} (Intramuscular-Rat) 1750 mg/kg LDLo (Oral-Mammal-Species Unspecified) 1400 mg/kg TDLo (Oral-Rat) 115 gm/kg/90 days-continuous: Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight; Related to Chronic Data: death TDLo (Oral-Rat) 105 mg/kg/30 weeks-intermittent: Liver: liver function tests impaired, changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain TDLo (Oral-Rat) 500 mg/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death, Specific Developmental Abnormalities: musculoskeletal system TDLo (Oral-Rat) 4500 mg/kg: female 6-15 day(s) after conception: Reproductive: Maternal Effects: other effects TDLo (Oral-Rat) 500 mg/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: urogenital system	TDLo (Skin-Rat) 2250 mg/kg: female 6-15 day(s) after conception: Reproductive: Maternal Effects: other effects	continuous: Behavioral: somnolence (general depressed activity); Skin and Appendages: dermatitis, irritative (after systemic exposure); Related to Chronic Data: death TCLo (Inhalation-Rat) 400 mg/m^3/5 hours/26 weeks-intermittent: Lungs, Thorax, or Respiration: respiratory depression; Liver: liver function tests impaired; Kidney, Ureter, Bladder: proteinuria TCLo (Inhalation-Rat) 300 mg/m^3/5 hours/26 weeks-intermittent: Kidney, Ureter, Bladder: proteinuria, other changes in urine composition; Nutritional and Gross Metabolic: weight loss or decreased weight gain TCLo (Inhalation-Dog) 102 ppm/24 hours/30 days-continuous: Behavioral: somnolence (general depressed activity); Skin and Appendages: dermatitis, irritative (after systemic exposure); Related to Chronic Data: death TCLo (Inhalation-Guinea Pig) 75 ppm/24 hours/24 days-continuous: Behavioral: somnolence (general depressed activity); Skin and Appendages: dermatitis, irritative (after systemic exposure); Related to Chronic Data: death
	Open irritation test (skin-Rabbit) 505 mg: Moderate Standard Draize test (Skin-Rabbit) 250 µg: Severe	Cytogenetic analysis (Human-Lymphocyte) 100 µmol/L Sister chromatid exchange (Human-Lymphocyte) 1 mmol/L	
Glycol Wetting Agent	LD_{50} (Oral-Rat): 20 g/kg LD_{50} (Oral-Mouse) 22 g/kg LD_{50} (Oral-rabbit) 18500 mg/kg LD_{50} (Oral dog) 22 gm/kg LD_{50} (Oral-guinea pig) 18350 mg/kg LD_{50} (Oral-quail) > 2080 mg/kg TDLo (Oral-Child) 79 g/kg/56 weeks-intermittent: Central nervous system effects, BRN TDLo (Parenteral-Infant) 10 g/kg/3 days-continuous: Systemic effects LD_{50} (Intraperitoneal-Rat) 6660 mg/kg LD_{50} (Intraperitoneal-Mouse) 9718 mg/kg LD_{50} (Intravenous-Rat) 6423 mg/kg LD_{50} (Intravenous-Mouse) 6630	Skin-Human 500 mg/7 days Mild irritation effects Skin-Human 104 mg/3 days-intermittent Moderate irritation effects Skin-man: 10%/2 days LD_{50} (Skin-rabbit) 20800 mg/kg LD_{50} (Subcutaneous-Rat) 22,500 mg/kg LD_{50} (Subcutaneous-Mouse) 17,370 mg/kg LDLo (Subcutaneous-guinea pig) 15500 mg/kg	TCLo Inhalation-rat) 2180 mg/m^3/6 hours/90 days-intermittent: Behavioral: food intake (animal); Endocrine: changes in spleen weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

	mg/kg LD_{50} (Intravenous-rabbit) 6500 mg/kg LD_{50} (Intravenous-dog) 26 gm/kg LDLo (Intravenous-chicken) 27 gm/kg: Vascular: other changes LD_{50} (Intramuscular-Rat) 14 g/kg TDLo (Intraperitoneal-Mouse) 100 mg/kg (15 days preg): Teratogenic effects TDLo (Intraperitoneal-Mouse) 100 mg/kg (11 days preg): Reproductive effects LDLo (Intramuscular-rabbit) 6300 mg/kg: Behavioral: somnolence (general depressed activity); Behavioral: coma; Lungs, Thorax, or Respiration: respiratory stimulation		
	Eye effects-Rabbit, adult 100 mg Mild irritation effects Eye effects-Rabbit, adult 500 mg/24 hours Mild irritation effects	DNA Inhibition (Mouse-Subcutaneous) 8000 mg/kg Cytogenetic Analysis (Subcutaneous-Mouse) 8000 mg/kg Cytogenetic Analysis (Hamster-fibroblast) 32 g/L	
Chelate Agent 2	N/A	N/A	N/A
Surfactant	N/A	N/A	N/A

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1	Ecotoxicity	LC_{50}, mg/L	EC_{50}, mg/L
	Organic amine		
	Aquatic	LC_{50} (goldfish) 24 hours = 190 mg/L (@ pH 10.1) LC_{50} (goldfish) 96 hours = 170 mg/l (@ pH 10.1) LC_{50} (goldfish) 24 hours = > 5,000 mg/L (@ pH 7) LC_{50} (goldfish) = > 5000 mg/L, 24 hours K_{OW} = -1.31 (est.) Biodegradation: Biological oxygen demand (BOD): 78%, 5 days; (theoretical) 0%, 5 days; 64%, 20 days. Persistence: Biodegrades at moderate rate. Aquatic Fate: If released to water, Organic amine should undergo biodegradation. The half-life in water is expected to be from a few days to weeks, depending on the acclimatization in the aquatic system. Atmospheric Fate: If released to the atmosphere, Organic amine is expected to exist entirely in the vapor phase. The primary mechanism of removal from the atmosphere would be by reaction with photochemically generated hydroxyl radicals, with an expected half-life of 4 hours. The complete solubility if Organic amine suggests that it will also be removed by precipitation.	EC_0 (*Pseudomonas putida* bacteria) 16 hours = 6,300 mg/L EC_0 (*Microcystis aeruginosa* algae) 8 days = 1.6 mg/L EC_0 (*Scenedesmus quadricauda* green algae) 7 days = 0.75 mg/L EC_0 (*Entosiphon sulcatum* protozoa) 72 hours = 300 mg/L EC_0 (*Uronema parduczi* Chatton-Lwoff protozoa) = 2,945 mg/L
	Terrestrial	If released to soil, Organic amine is expected to biodegrade fairly rapidly following acclimatization, with a half-life on the order of days to week. Organic amine will leach in soil to groundwater. Volatilization is not a significant fate process from the soil.	NE
	Glycol Wetting Agent		
		LC_{50} (*Lebistes reticulatus*, guppy) 48 hours > 10,000 mg/L LC_{50} (*Carassius auratus*) 24 hours = > 5,000 mg/L LC_{50} (*Salmo gairdneri*) 24 hours = 50,000 mg/L LC_{50} (*Pimephales promelas*) 96 hours = 54,900 mg/L	EC_{50} (*Photobacterium phosphoreum*, bacteria) 30 minutes = 26,800 mg/L TD (*Chlorella pyrenoidosa*, algae) = 92,000 mg/L EC_0 (*Daphnia magna*, crustacean) 48 hours = < 4,295 mg/L

		LC_{50} (Artemia salina) 24 hours = >10,000 mg/L LC_{100} (*Pimephales promelas*) 96 hours = 65,610 mg/L NOEC (*Pimephales promelas*) 96 hours < 47,829 mg/L fingerling trout: at 50,000 mg/l at 10°C: no mortality or apparent signs of stress were produced during a 25-hr exposure period (static bioassay) Log K_{ow} = -0.30-1.41 Biodegradation: Standard dilution BOD water, 5-day 64% theoretical biochemical oxygen demand, sewage inocula. Warburg respirometer, 40-day 78% theoretical biochemical oxygen demand, sewage inocula. Nutrient broth, 100% degradation in 4 days (aerobic conditions), 100% degradation in 4-9 days (anaerobic conditions), activated sludge, or digester sludge inocula, no significant degradation in sterile controls. Standard dilution BOD water, 5-day 2.2% theoretical biochemical oxygen demand, 10-day 56.7% theoretical biochemical oxygen demand, 50-day 80% theoretical biochemical oxygen demand, sewage inocula. Standard dilution BOD water, 5-day 62% theoretical biochemical oxygen demand, 20-day 79% theoretical biochemical oxygen demand, sewage inocula; synthetic seawater dilution, 5-day 55% theoretical biochemical oxygen demand, 20-day 83% theoretical biochemical oxygen demand, raw wastewater inocula. Sewage die-away, 74.5% theoretical biochemical oxygen demand in 5 days.	EC_{50} (*Daphnia magna*, crustacean) 48 hours = 34,400 mg/L EC_{100} (*Daphnia magna*, crustacean) 48 hours = 50,000 mg/L EC_{50} (*Daphnia magna*, crustacean) 24 hours = > 10,000 mg/L EC_{100} (*Daphnia magna*, crustacean) 24 hours = > 10,000 mg/L EC_{50} (*Nitocra spinipes*, crustacean) 96 hours = > 10,000 mg/L
	Chelate Agent		
		LC_{100} (*Cyprinus carpio*) 24 hours = 180 ppm/ at 25°C TLm (mosquito fish) 96 hours = 125 ppm/ (fresh water) TLm (bluegill) 48 hours = 99 mg/L/ (tap water) LC_{50} (*Lepomis macrochirus* bluegill) 96 hours = 486 mg/L LC_{50} (*Lepomis macrochirus* bluegill) 96 hours = 490-1030 mg/L (static bioassay) LC_{50} (*Lepomis macrochirus* bluegill) 96 hours = > 500 mg/L LC_{50} (*Leuciscus Idus*) 96 hours = > 500 mg/L LC_{50} (Algae) 72 hours = 10-100 mg/L LC_{50} (*Daphnae*) 24 hours > 100 mg/L Biological Oxygen Demand = 20 mg O_2/g product, Chemical Oxygen Demand = 575 mg O_2/g product.	
12.2	Persistence and Degradability	The components of this product decompose in soil and water.	
12.3	Bioaccumulative Potential	This product is not expected to bioaccumulate	
12.4	Mobility in Soil	When spilled onto soil, this product will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity.	
12.5	Other Adverse Ecological Effects	This product may be harmful to aquatic life if large volumes of it are released into an aquatic environment.	

13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal	Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with local regulations. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.
Disposal of Contaminated Packaging	Cleaned containers can be recycled or disposed of as non-contaminated waste, if authorized by your local authorities. Dispose of containers as required by local regulations.
U.S. EPA Waste Number	Not applicable as supplied.

14. TRANSPORT INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1	UN Number	UN 2735
14.2	UN Proper Shipping Name	Amines, liquid, corrosive, n.o.s. (Ethanolamine)
14.3	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
14.4	Packing Group	II
14.5	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2012)	154
14.6	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Y3/D3
14.7	Special Transport Precautions	Not applicable
	National Motor Freight Classification	#70

International Air Transport Association

14.8	UN Number	UN 2735
	UN Proper Shipping Name	Amines, liquid, corrosive, n.o.s. (Ethanolamine)
	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
	Packing Group	II
	Packaging Instructions	850/854

International Maritime Organization

14.9	UN Number	UN 2735
	UN Proper Shipping Name	Amines, liquid, corrosive, n.o.s. (Ethanolamine)
	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
	Packing Group	II
	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2012)	154
	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Y3/D3

15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

PROGRAM	Chelate	Organic amine	Glycol Wetting Agent	Chelate Agent 2	Octyl dimethylamine Oxide	
US EPA PROGRAMS						
Clean Air Act Hazardous Air Pollutants	NO	NO	NO	NO	NO	
Safe Drinking Water Act	NO	NO	NO	NO	NO	
RCRA F, K, P, U or D-lists	NO	NO	NO	NO	NO	
EPA Priority Pollutant	NO	NO	NO	NO	NO	
SARA 302 RQ	NO	NO	NO	NO	NO	
SARA 302 TPQ	NO	NO	NO	NO	NO	
SARA 313 LISTED	NO	NO	NO	NO	NO	
SARA CHEMICAL CATEGORIES						
SARA 311/312 ACUTE	NO	YES	NO	NO	NO	
SARA 311/312	NO	YES	NO	NO	NO	

CHRONIC						
SARA 311/312 FIRE	NO	NO	NO	NO	NO	
SARA 311/312 PRESSURE	NO	NO	NO	NO	NO	
SARA 311/312 REACTIVITY	NO	NO	NO	NO	NO	
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO	NO	NO	NO	NO	
CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)						
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)						
US OSHA PROGRAMS						
PEL	NO	8 mg/m^3	NO	NO	NO	
PSM	NO	NO	NO	NO	NO	
CHEMICAL SECURITY PROGRAMS						
DHS CFATS	NO	NO	NO	NO	NO	
CHEMICAL WEAPONS CONVENTION						
	NO	NO	NO	NO	NO	
US DRUG ENFORCEMENT ADMINISTRATION						
DEA Controlled Substances	NO	NO	NO	NO	NO	
CHEMICAL INVENTORY PROGRAMS						
WHMIS	NO	E	NO	NO	D2B	
DSL	YES	YES	YES	YES	YES	
NDSL	N/A	N/A	N/A	N/A	N/A	
REACH Pre-registered List	YES	YES	YES	NO	YES	
TSCA	YES	YES	YES	YES	YES	
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES	YES	YES	YES	
EU No-Longer Polymers List (NLP)	N/A	N/A	N/A	N/A	N/A	
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	NO	Xi Harmful	NO	NO	Xi Harmful	
Philippines	YES	YES	YES	YES	YES	
Japan	YES	YES	YES	YES	YES	
Australia	YES	YES	YES	YES	YES	
Korea	YES	YES	YES	YES	YES	
China	YES	YES	YES	YES	YES	
New Zealand Inventory of Chemicals	YES	YES	YES	YES	YES	

16. OTHER INFORMATION

16.1	Original Preparation	Jan 5, 2009
16.2	Revision History	28 June 2013; GHS update
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	April 28, 2015

DEFINITIONS OF TERMS

16.5	A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:	
	Section 2	**GHS**: Global Harmonization System **OSHA:** U.S. Occupational Safety and Health Administration. **CLP**: Classification and Packaging **WHMIS**: Workplace Hazardous Materials Information System **STOT**: Specific Target Organ Toxicity
	Section 3	**CAS #:** Chemical Abstract Service index number **EINECS #:** European Chemical Substances Information System index number
	Section 5	**NFPA:** Nation Fire Protection Association **Health Hazard: 0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). **Flammability Hazard** **Reactivity Hazard:** Refer to definitions for "Hazardous Materials Identification System". **Flash Point**: Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. **Autoignition Temperature:** The minimum temperature required to initiate combustion in air with no other source of ignition. **LEL:** The lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL**: The highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.
	Section 8	**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order. **IDLH -** Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE (Not Established)** is made for reference.
	Section 11	**LD_{50}** : Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** : Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm:** Concentration expressed in parts of material per million parts of air or water; **mg/m^3** : Concentration expressed in weight of substance per volume of air; **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.
	Section 12	**LC_{50}:** The lowest concentration in water which kills 50% of the test subjects. **EC_{50}:** The Effect Concentration in water at which 50% of the test species if affected.
	Section 13	**US EPA Hazardous Waste Codes**: refer to 40 CFR 261.20
	Section 14	**DOT**: US Department of Transportation **IATA**: International Air Transport Association **IMO**: International Maritime Organization **MARPOL:** International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 **IBC Code** : Merchant Shipping Code
	Section 15	**RCRA**: US Resource Conservation and Recovery Act **SARA:** US Superfund Amendments and Reauthorization Act **PSM**: US OSHA Process Safety Management **CFATS:** US Department of Homeland Security Chemical Facility Anti-terrorism Standard **DSL:** Canadian Domestic Substances List **NDSL:** Canadian Non-Domestic Substances List **REACH**: European Registration, Evaluation, Authorization and Restriction of Chemicals list **TSCA:** US Toxic Substances Control Act

Brenntag Canada Inc.

BRENNTAG

MATERIAL SAFETY DATA SHEET

STANCOOL E-SERIES BLENDS

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
43 Jutland Rd.
Toronto, ON
M8Z 2G6
(416) 259-8231

Website: http://www.brenntag.ca

WHMIS#: 00060759
Index: HCI0169/16D
Effective Date: 2016 December 14
Date of Revision: 2016 December 14

EMERGENCY TELEPHONE NUMBER (For Emergencies Involving Chemical Spills or Releases)

1 855 273 6824

PRODUCT IDENTIFICATION

Product Name:	Stancool E-Series Blends.
Chemical Name:	Not applicable.
Synonyms:	Stancool E30 (8408); Stancool E35 (9422); Stancool E40; Stancool E45 (9699); Stancool E50 (8255, 8291); Stancool E55; Stancool E60 (8254); Stancool E80 (8252); Stancool E100 (8251).
Chemical Family:	Blend
Molecular Formula:	Not applicable.
Product Use:	Industrial solvent, cleaner, degreaser. Automotive coolant/antifreeze. Chemical intermediate. Heat transfer fluid.

WHMIS Classification / Symbol:

D-2A: Very Toxic (teratogen)
D-2B: Toxic (skin and eye irritant)

READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Ingredient	*CAS#*	*ACGIH TLV (TWA)*		*% Concentration*
Ethylene Glycol	107-21-1	—	*A4	30 - 100
Dipotassium Hydrogen Phosphate	7758-11-4	---		0.5 - 1.5

The identity of one or more of the ingredient(s) of this product have not been disclosed by our supplier(s) and we are not aware of any additional health hazards due to these ingredients, which are not already identified on this MSDS.

A4 = Not classifiable as a human carcinogen. (ACGIH-A4).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Harmful if inhaled, absorbed through skin, or swallowed. Mists or sprays are irritating to eyes and respiratory tract. Can cause skin and eye irritation. May cause teratogenic effects. See "Other Health Effects" Section. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation:	Excessive contact with mist or spray may cause irritation of mucous membranes, coughing and difficulty in breathing. See "Other Health Effects" Section.
Skin Contact:	Can cause skin irritation. May cause defatting, drying and cracking of the skin. Prolonged and repeated contact may lead to dermatitis.
Skin Absorption:	May be readily absorbed through broken or damaged skin.
Eye Contact:	Splashes to the eye may cause irritation, redness and pain.
Ingestion:	Ingestion is not a likely route of exposure. Ingestion of large amounts may cause nausea, gastrointestinal upset and abdominal pain.
Other Health Effects:	Effects (irritancy) on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. Ethylene Glycol poisoning occurs in three stages: central nervous system (CNS) depression, cardiopulmonary failure and kidney failure. The severity of those stages, and advancement from one stage to another depends upon the dose ingested. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Survival of CNS depression may be followed by cardiopulmonary failure, which is initiated by the onset of coma and is characterized by quick, shallow breathing, excessively fast heart beat, mild hypertension and cyanosis. Survival of cardiopulmonary failure may be followed by kidney damage, which may range from a mild increase in blood urea nitrogen to complete kidney failure and possible death. In severe cases of overexposure, pulmonary oedema, bronchopneumonia, cardiac enlargement and possible death may occur. Pulmonary oedema is the exposure to high concentrations of a substance causing the build-up of fluid in the lungs that might be fatal. Symptoms of pulmonary oedema, such as shortness of breath, may not appear until several hours after exposure and are aggravated by physical exertion. There may be cranial nerve involvement in the late stages of toxicity from swallowed Ethylene Glycol. In particular, effects have been reported from the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing and difficulty in swallowing (dysphagia). (3) May cause liver damage, kidney damage, metabolic acidosis, systemic poisoning and death. Liver damage is characterized by the loss of appetite, jaundice (yellowish skin colour), and occasional pain in the upper left-hand side of the abdomen. Signs and symptoms of kidney damage generally progress from oliguria, to blood in the urine, to total renal failure. Metabolic acidosis is a condition that describes a decreased pH and bicarbonate concentration in the body fluids. Dipotassium Hydrogen Phosphate may cause hyperkalemia, hypocalcemic tetany, acidosis, cardiac arrhythmia, weakness, low blood pressure, paralysis, irregular, rapid breathing and peripheral nervous system (PNS) effects. Hyperkalemia is a term that describes an abnormally high blood concentration of potassium ions. All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcemia. Potassium salts have a potential risk of hyperkalemia which can cause cardiac arrhythmia. Symptoms of potassium poisoning may occur. These include slow heartbeat, accelerated breathing, muscle weakness and, in severe cases, paralysis. Peripheral Neuropathy is a progressive disorder of the nervous system characterized by sensory and motor abnormalities, muscle spasms, weakness and pain in the arms and legs, numbness and tingling of the fingers and toes and paralysis.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:	If respiratory problems arise, move the victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.
Skin Contact:	Start flushing while removing contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice.
Eye Contact:	Immediately flush eyes thoroughly for 5 minutes with running water. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians:	This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Ethylene Glycol is metabolized by alcohol dehydrogenase to various metabolites including glycoaldehyde, glycolic acid, and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. (3) The currently recommended medical management of Ethylene Glycol poisoning includes elimination of Ethylene Glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow-up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% Sodium Bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. (3) Pulmonary oedmea with low arterial oxygen levels (hypoxemia) has been described in a number of patients following poisoning with Ethylene Glycol. The mechanism of production has not been elucidated, but it appears to be not carcinogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. (3) As a competitive substrate for alcohol dehydrogenase, Ethyl Alcohol is antidotal. Given in the early stages of intoxication, it blocks the formation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range of 100-150 mg/dL, and should be achieved by a rapid loading dose and maintained by intravenous infusion. (3) For severe and/or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood Ethylene Glycol concentration greater than 25 mg/dL, or compromise of renal function. (3) 4-Methylpyrazole, a potent inhibitor of alcohol dehydrogenase, has been effectively used to decrease the metabolic consequences of Ethylene Glycol poisoning before metabolic acidosis, coma, seizures and renal failure have occurred. (3) Additional therapeutic measures may include the administration of cofactors involved in the metabolism of Ethylene Glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours. (3) Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE-FIGHTING MEASURES

Flashpoint (°C)	*AutoIgnition Temperature (°C)*	Flammability Limits in Air (%): *LEL*	*UEL*
111 (Estimated)	398 (Estimated)	3.2 (Estimated)	15.3 (Estimated)

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include potassium pyrophosphate, oxides of carbon, phosphorus, silicon, potassium, nitrogen, sulphur, sodium and irritating gases. Heating in air may produce irritating aldehydes, acids and ketones.
Unusual Fire or Explosion Hazards:	Not normally a fire hazard. Water content of product prevents ignition. Do not direct a solid stream of foam into hot, burning pools. This may cause spattering and increase fire intensity. Closed containers exposed to heat may explode.
Sensitivity to Mechanical Impact:	Not expected to be sensitive to mechanical impact.
Rate of Burning:	Not available.
Explosive Power:	Not available.
Sensitivity to Static Discharge:	Not expected to be sensitive to static discharge.
EXTINGUISHING MEDIA	
Fire Extinguishing Media:	Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. This material may produce a floating fire hazard in extreme fire conditions.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters:	Isolate materials that are not involved in the fire and protect personnel. Cool containers with flooding quantities of water until well after the fire is out. Spilled material may cause floors and contact surfaces to become slippery.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures:	In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Wear protective clothing. Recover spilled material on non-combustible absorbents, such as sand or vermiculite, and place in covered containers for disposal. Use spark-resistant tools. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dikes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING

Handling Practices:	Use normal "good" industrial hygiene and housekeeping practices. Drums which have been exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn. Vent container frequently, and more often in warm weather, to relieve pressure.
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing vapours and aerosols. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product. Sudden release of hot organic chemical vapours or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

STORAGE

Storage Temperature (°C):	See below.
Ventilation Requirements:	General exhaust is acceptable. Local exhaust ventilation preferred.
Storage Requirements:	Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Do not expose sealed containers to temperatures above 40° C. Protect from direct sunlight. Protect against physical damage.
Special Materials to be Used for Packaging or Containers:	Materials of construction for storing the product include: steel. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls:	Local exhaust ventilation required. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect. For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the "buddy" system. The second person should be in view and trained and equipped to execute a rescue. (6)

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Eye Protection:	Safety glasses with side shields are recommended as minimal eye protection. Use full face-shield or chemical safety goggles when there is potential for contact. Contact lenses should not be worn when working with this material.
Skin Protection:	Gloves and protective clothing made from PVC, butyl rubber, natural rubber, viton, neoprene or nitrile rubber should be impervious under conditions of use. Prior to use, user should confirm impermeability. Discard contaminated gloves.
Respiratory Protection:	No specific guidelines available. A NIOSH/MSHA-approved air-purifying respirator equipped with organic vapour cartridges for concentrations up to 1 000 ppm. An air-supplied respirator if concentrations are higher or unknown. If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (6)
Other Personal Protective Equipment:	Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact.

EXPOSURE GUIDELINES

SUBSTANCE	***ACGIH TLV***	***OSHA PEL***		***NIOSH REL***	
	(STEL)	***(TWA)***	***(STEL)***	***(TWA)***	***(STEL)***
Ethylene Glycol	100 mg/m³ (Ceiling, Aerosol only)	---	---	---	---

The identity of one or more of the ingredient(s) of this product have not been disclosed by our supplier(s) and we are not aware of any additional health hazards due to these ingredients, which are not already identified on this MSDS.

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State:	Liquid.
Appearance:	Clear colourless liquid. Also comes in a dyed version.
Odour:	Mild odour.
Odour Threshold (ppm):	Not available.
Boiling Range (°C):	100 - 197.
Melting/Freezing Point (°C):	-48 to -16
Vapour Pressure (mm Hg at 20° C):	Not available.
Vapour Density (Air = 1.0):	2.1.
Relative Density (g/cc):	1.04 - 1.15.
Bulk Density:	1 040 - 1 150 kg/m³.
Viscosity:	Not available.
Evaporation Rate (Butyl Acetate = 1.0):	Not available.
Solubility:	Soluble in water.
% Volatile by Volume:	Expected to evaporate very slowly at ambient temperatures.
pH:	Not available.
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	30 - 100.
Flashpoint (°C):	111 (Estimated)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not normally a fire hazard. Water content of product prevents ignition.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Keep tightly closed to protect quality. Temperatures above 165 °C. (3)
Materials to Avoid:	Strong oxidizers. Reducing agents. Lewis or mineral acids. Strong bases. At elevated temperatures: Product can react explosively with Acids. Epoxy. Materials reactive with hydroxyl bearing compounds. Aluminum and its alloys Perchloric Acid. Isocyanates. Phosphorus (V) Sulfide.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include potassium pyrophosphate, oxides of carbon, phosphorus, silicon, potassium, nitrogen, sulphur, sodium and irritating gases. Heating in air may produce irritating aldehydes, acids and ketones.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Ethylene Glycol	4 700 mg/kg (1)	9 530 mg/kg (1)	>200 (1)
Dipotassium Hydrogen Phosphate	4 750 - 8 100 mg/kg (3)	> 5 000 mg/kg (3)	---

The identity of one or more of the ingredient(s) of this product have not been disclosed by our supplier(s) and we are not aware of any additional health hazards due to these ingredients, which are not already identified on this MSDS.	
Carcinogenicity Data:	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.
Reproductive Data:	Not available. No adverse reproductive effects are anticipated. See "Other Studies Relevant to Material".
Mutagenicity Data:	Not available. No adverse mutagenic effects are anticipated. See "Other Studies Relevant to Material".
Teratogenicity Data:	Based on animal studies, ingestion of very large amounts of Ethylene Glycol appears to be the major and possibly the only route of exposure to produce birth defects. (3) See "Other Studies Relevant to Material".
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	Ethylene Glycol: Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide. (6)
Other Studies Relevant to Material:	Ethylene Glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The absence of a carcinogenic potential for Ethylene Glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects. (3) Ethylene Glycol caused mild skin and eye irritation when tested in rabbits. (3) Dipotassium Hydrogen Phosphate: Kidney damage was observed in dogs following administration of 800 mg/Kg dipotassium phosphate in the diet for 14 or 38 weeks. No adverse effects were observed after rats were fed 5.1 % in the diet for 150 days. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Not available. May be harmful to aquatic life. Ethylene Glycol: LC50 Pimephales promelas (Fathead Minnow), static test, 96 h = 72,860 mg/L (3) LC50 (Bluegill) = 27,549 mg/L (3) LC50 (Rainbow Trout) = 18,000 - 46,000 mg/L (3) LC50 (Guppy) = 49,000 mg/L. (3) LC50 (brine Shrimp) = 20,000 mg/L (3) LC50 (Goldfish) = Above 5,000 mg/L (3)
Environmental Fate:	Not available. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	None required.
Waste Disposal Methods:	This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.
Safe Handling of Residues:	See "Waste Disposal Methods".
Disposal of Packaging:	Empty containers retain product residue and can be hazardous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Dispose of waste material at an approved landfill site in accordance with applicable local, provincial and federal regulations.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

This product is not regulated by TDG.

Label(s): Not applicable. Placard: Not applicable.

ERAP Index: -----. Exemptions: None known.

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

This product is not regulated by DOT.

Label(s): Not applicable. Placard: Not applicable.

CERCLA-RQ: Not available. Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR: All components of this product are included on the DSL.

CEPA - NPRI: Ethylene Glycol.

Controlled Products Regulations Classification (WHMIS):

D-2A: Very Toxic (teratogen)

D-2B: Toxic (skin and eye irritant)

USA

Environmental Protection Act: All components of this product are included on the TSCA inventory.

OSHA HCS (29CFR 1910.1200): Teratogenic and Embryotoxic, Skin and Eye Irritant.

NFPA: Health, Fire, Reactivity (Not available.)

HMIS: Health, Fire, Reactivity (Not available.)

INTERNATIONAL

Not available.

16. OTHER INFORMATION

REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO chemical profile, Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2011, American Conference of Governmental Industrial Hygienists, Cincinnati, 2011.
6. Regulatory Affairs Group, Brenntag Canada Inc.
7. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.
8. NFPA 325M Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1994 Edition, Quincy, MA, 1994.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

British Columbia: 20333-102B Avenue, Langley, BC, V1M 3H1
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Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

RoClean P303
SAFETY DATA SHEET

1. Company and Product Identification

1.1	Identification – Product Name:	**RoClean P303**
1.2	Other means of identification	Organic Acid MIXTURE
	Synonym:	Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use:	Reverse osmosis membrane treatment Use only as directed on the label.
1.4	Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	**AVISTA TECHNOLOGIES** 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
	Competent Person email address	klindsey@avistatech.com
	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-703-527-3887 (International Collect)

DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NSF INTERNATIONAL TO ANSI/NSF 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE OFF-LINE IN REVERSE OSMOSIS SYSTEMS

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a white to cream-colored, corrosive solid. This product may irritate or burn contaminated tissue, depending on concentration and duration of contact. Depending on the duration of contact, over-exposures can severely irritate or cause burns to the eyes. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. carbon monoxide and carbon dioxide). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.

Physical Hazards Summary	None
Potential Health Hazards Summary	Specific Target Organ Toxicity Single Exposure - Category 3 Skin Corrosion/Irritation - Category 1B Eye Irritation - Category 1 Acute toxicity, Oral (Category 4) Serious eye damage (Category 1)
Potential Ecological Effects Summary	Acute Hazards to the aquatic environment - Category 3

2.1 Classification Of Product

U.S. OSHA classification	Corrosive, Skin, eye irritant
Classification as per EC 1272/2008 (CLP/GHS)	Corrosive, category 1B Skin irritation, category 2B Eye irritation category 2 B Xi Irritant
WHMIS classification	E, corrosive, D2B Poisonous and infectious material - Other effects – Toxic

Hazardous Materials Information System (HMIS) Rating

Health	**2**
Flammability	**0**
Physical Hazard	**0**
Protective Equipment	**D**

2.2 Label Elements OSHA/GHS

General Warnings	P101	If medical advice is needed, have product container or label at hand.
	P102	Keep out of reach of children.
	P103	Read label before use
	P403	Store in a well-ventilated place.
	P233	Keep container tightly closed
Signal Word	DANGER!	
Hazard statements	H302	Harmful if swallowed
	H 312	Harmful in contact with skin
	H315 + H320	Causes skin or eye irritation
	H319	Causes serious eye irritation
	H314-H335	Causes severe skin burns and eye damage. May cause respiratory irritation
	H318	Causes serious eye damage
	H335	May cause respiratory irritation
	H402	Harmful to aquatic life
Precautionary statements	P305	IF IN EYES, RINSE THOROUGHLY WITH RUNNING WATER
	P338	Remove contact lenses if present and easy to do. Continue rinsing.
	P261	Avoid breathing dust
	P280	Wear protective gloves/protective clothing/eye protection/face protection
	P271	Use only outdoors or in a well-ventilated area.
	P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P302/P352	
	P337 + P313	If eye irritation persists: Get medical advice/attention.
	P404	Store in a closed container.
Hazard pictograms		

2.3 Unclassified Hazards None

2.4 Ingredients with unknown acute toxicity None

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical name **CAS #** **EINECS #**	**% w/w**	**US OSHA**	**GHS/EU CLP**	**WHMIS**
Organic acid Proprietary Proprietary	60-80	Irritant	GHS: Eye Irritant Cat 2 CLP: Xi - irritant	D2B - Poisonous and infectious material - Other effects – Toxic
Polyphosphate Proprietary Proprietary	20-30	Corrosive	Acute Hazards to the aquatic environment - Category 3 Specific Target Organ Toxicity Single Exposure - Category 3 Skin Corrosion/Irritation - Category 1B Serious Eye Damage Eye Irritation - Category 1	E, Corrosive
Chelate Proprietary Proprietary	10-15	Harmful by ingestion Irritant	Acute toxicity, Oral (Category 4) Serious eye damage (Category 1) H302 Harmful if swallowed. H318 Causes serious eye damage. P280 Wear protective gloves/ eye protection/ face protection. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	E, Corrosive, D2B Poisonous and infectious material - Other effects – Toxic
Flow control agent Proprietary Proprietary	1-5	Dust inhalation hazard	Acute toxicity dusts & mists, category 2	D2B - Poisonous and infectious material - Other effects – Toxic
PRODUCT CLASSIFICATION	100	Corrosive, skin/eye irritant	Skin Corrosion/Irritation - Category 1B Serious Eye Damage Eye Irritation - Category 1 Acute toxicity oral, Category 3 Acute Hazards to the aquatic Environment, Category 2	E, Corrosive D2B - Poisonous and infectious material - Other effects – Toxic

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

4. FIRST-AID MEASURES

4.1 Description of Necessary Measures

Skin exposure: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

Eye exposure: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

Inhalation: If dust of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

4.2 Most Important Symptoms/Effects:

Immediate: Inhalation exposure may cause coughing or sneezing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.

Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.

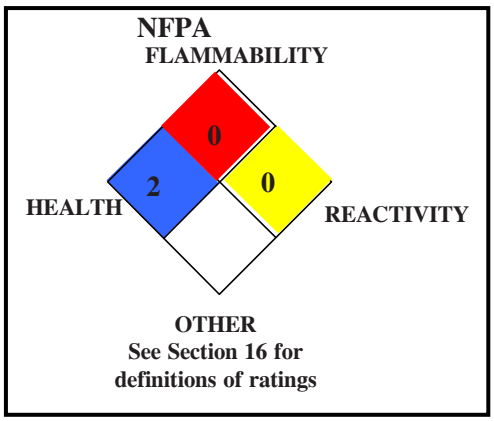
4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary:

TARGET ORGANS: Acute: Skin, eyes. Chronic: Skin.

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

5. FIRE-FIGHTING MEASURES

Flammable properties Non-flammable aqueous solution



Flash Point °C: Not applicable.

Autoignition Temperature °C: Not applicable.

Flammable Limits (in air by volume, %):
Upper: Not applicable.
Lower: Not applicable.

5.1 Suitable And Unsuitable Extinguishing Media:

This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water spray	YES	Carbon dioxide	YES
Foam	YES	Dry chemical	YES
Halon	YES	Other	YES

5.2 Specific Hazards Arising From Chemical:

When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and nitrogen oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.
Explosion Sensitivity to Static Discharge: Not applicable.

5.3 Special Protective Equipment And Precautions For Fire-Fighters:

Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

6.1	Personal Precautions	Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people.
	Protective equipment	For small releases (< 20 kg), clean up spilled powder wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incidental releases (more than 20 kg) should be Level C: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and full-face respirator with HEPA filter.
	Emergency procedures	Monitoring must indicate that exposure levels are below those provided in Section 8 (Exposure Controls-Personal Protection) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus.
6.2	Methods and Materials for Containment and Cleaning Up	Moisten to suppress dust. Shovel up solids into plastic container for recovery/disposal. Neutralize residue with sodium bicarbonate or other neutralizing agent for dilute acids. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable plastic container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

7.1	Precautions for Safe Handling	All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual powder; therefore, empty containers should be handled with care. As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating dust of this product. Remove contaminated clothing immediately. During equipment maintenance follow practices indicated in Section 6 (Accidental Release Measures) to decontaminate equipment or clean-up small spills. Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate local standards.
7.2	Conditions For Safe Storage	Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.
	Incompatibilities	Strong acids, oxidizers

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

8.1 Control Parameters

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLVs		OSHA-PELs			OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Organic acid	Proprietary	60-80	NE	NE	NE	NE	NE	NE
Polyphosphate	Proprietary	20-30	NE	NE	NE	NE	NE	NE
Chelate	Proprietary	10-15	NE	NE	NE	NE	NE	NE
Flow control agent	Proprietary	1-5	10 (inhalable fraction); 3 (respirable	NE	50 mppcf or 5 (total dust) 15 mppcf or 5 (respirable	NE	NE	DFG MAK: TWA = 4 (inhalable fraction); 1.5 (respirable fraction)

			fraction)		fraction)			
Water and other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentration present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

8.2 Appropriate Engineering Controls. Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section or as low as reasonably achievable. Ensure eyewash/safety shower stations are available near areas where this product is used.

8.3 Personal Protective Equipment

Respiratory protection: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists or vapor. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the applicable local standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full-face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Eye protection: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.

Hand protection: Wear chemical impervious gloves (e.g., Solvex™, Neoprene).

Body protection: If needed, use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance	This product is a white to cream-colored, corrosive solid.		
Odor	None	Odor Threshold	N/A
Melting Point °C (°F)	NE	pH	2.8-3.5
Initial Boiling Point °C (°F)	NE	Boiling Point Range °C	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	N/A
Vapor Density (air = 1)	N/A	Vapor Pressure mm Hg @ 20°C:	N/A
Solubility (in water)	Soluble	Relative density (water = 1)	NE
Viscosity	Flowing solid	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	NE		
How To Detect This Substance (Warning Properties):	Litmus paper will turn red in contact with solutions of this solid.		

10. STABILITY and REACTIVITY

10.1	Reactivity	Not considered reactive.
10.2	Chemical Stability	Stable
10.3	Possibility of hazardous reactions	Hazardous polymerization will not occur.
10.4	Conditions to avoid	Avoid mixing with incompatible materials.
10.5	Incompatible Materials	This product is a white to cream-colored, corrosive solid.
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate phosphorous oxides, carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Toxicity data for hazardous ingredients	Oral LD_{50} mg/kg	Dermal LD_{50} mg/kg	Inhalation LD_{50} mg/kg
Organic acid	LD_{50} (Oral-Rat) 3 g/kg LD_{50} (Oral-Mouse) 5040 mg/kg LD_{50} (Intraperitoneal-Rat) 883 mg/kg LD_{50} (Intraperitoneal-Mouse) 903 mg/kg LD_{50} (Subcutaneous-Rat) 5500 mg/kg LD_{50} (Subcutaneous-Mouse) 2700 mg/kg LD_{50} (Intraperitoneal-Mouse LD50: 903 mg/kg LD_{50} (Intravenous-Rabbit, adult) 330 mg/kg LD_{50} (Intravenous-Mouse) 42 mg/kg LDLo (Oral-Rabbit, adult) 7000 mg/kg	LD_{50} (dermal, rabbit) > 2000 mg/kg	N/A
	Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects Standard Draize Test (Eye-Rabbit, adult) 750 mg/24 hours: Severe irritation effects		
Polyphosphate	LD_{50} (oral, rat) > 7400 mg/kg LDLo (Intravenous-Rabbit, adult) 1580 mg/kg	LDLo (skin, rabbit) > 300 mg/kg	N/A
	Sex Chromosome Loss and Nondisjunction (Oral-Drosophila melanogaster) 11 pph	Standard Draize Test (Skin-rabbit) > 300 mg/kg	
Chelate	LD_{50} (Oral-Rat) = 1780 - 2000	LD_{50} (Rabbit) > 5000	LC_{50} (rat, 4 hr) 4.14 mg/L
Flow control agent	>10,000	>5,000	LC_O = 0.14/4 hrs; no deaths

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1	Ecotoxicity	LC_{50}, mg/L		EC_{50}, mg/L
	RoClean P303			
	Aquatic	Species	*P. promelas*	*C. dubia*
		Common Name	Fathead minnow	Water flea
		LC_{50} mg/L	854	325
		NOEL mg/L	625	157
		Duration, hrs	96	48
	Terrestrial	NE		NE
12.2	Persistence and Degradability	The components of this product decompose in soil and water.		
12.3	Bioaccumulative Potential	The components of this product are not expected to bioaccumulate.		
12.4	Mobility in Soil	When spilled onto soil, this product will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity. During transport through the soil, this product will dissolve some of the soil material, in particular, carbonate-based materials.		
12.5	Other Adverse Ecological Effects	This product may be harmful to aquatic life if large volumes of it are released into an aquatic environment.		

13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal	Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with local regulations. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.
Disposal of Contaminated Packaging	Cleaned containers can be recycled or disposed of as non-contaminated waste, if authorized by your local authorities. Dispose of containers as required by local regulations.
U.S. EPA Waste Number	D002 (Waste Characteristic Corrosivity) for wastes consisting only of this product.

14. TRANSPORT INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1	UN Number	UN3261
14.2	UN Proper Shipping Name	Corrosive solid, acidic, organic, n.o.s. (Citric acid)
14.3	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
14.4	Packing Group	II
14.5	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2012)	154
14.6	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable
14.7	Special Transport Precautions	Not applicable
	National Motor Freight Classification	#70

International Air Transport Association

14.8	UN Number	UN3261
	UN Proper Shipping Name	Corrosive solid, acidic, organic, n.o.s. (Citric acid)
	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
	Packing Group	II
	Packaging Instructions	822

International Maritime Organization

14.9	UN Number	UN3261
	UN Proper Shipping Name	Corrosive solid, acidic, organic, n.o.s. (Citric acid)
	Transport Hazard Class(es)	8 (Corrosive)
	Transport label(s) required	Corrosive Class 8
	Packing Group	II
	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2012	154
	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable

15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

PROGRAM	Organic acid	Polyphosphate	Chelate	Flow control agent
US EPA PROGRAMS				
Clean Air Act Hazardous Air Pollutants	NO	NO	NO	NO
Safe Drinking Water Act	NO	NO	NO	NO
RCRA F, K, P, U or D-lists	NO	NO	NO	NO
SARA 302 RQ	NO	NO	NO	NO
SARA 302 TPQ	NO	NO	NO	NO
SARA 313 LISTED	NO	NO	NO	NO
SARA CHEMICAL CATEGORIES				
SARA 311/312 ACUTE	YES	YES	NO	NO
SARA 311/312 CHRONIC	NO	NO	NO	NO
SARA 311/312 FIRE	NO	NO	NO	NO
SARA 311/312 PRESSURE	NO	NO	NO	NO
SARA 311/312 REACTIVITY	NO	NO	NO	NO
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO	NO	NO	NO
CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)				
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)				
US OSHA PROGRAMS				
PEL	NO	YES	NO	NO
PSM	NO	NO	NO	NO
CHEMICAL SECURITY PROGRAMS				
DHS CFATS	NO	NO	NO	NO
CHEMICAL WEAPONS CONVENTION				
	NO	NO	NO	NO
US DRUG ENFORCEMENT ADMINISTRATION				
DEA Controlled Substances	NO	NO	NO	NO
CHEMICAL INVENTORY PROGRAMS				
WHMIS	D2B	E	E, D2B	D2B
DSL	YES	YES	YES	YES
NDSL	N/A	N/A	N/A	N/A
REACH Pre-registered List	YES	YES	YES	YES
TSCA	YES	YES	YES	YES
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES	YES	YES
EU No-Longer Polymers List (NLP)	N/A	N/A	N/A	N/A
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	Xi Harmful	NO	NO	NO
Philippines	YES	YES	YES	YES
Japan	YES	YES	YES	YES
Australia	YES	YES	YES	YES
Korea	YES	YES	YES	YES
China	YES	YES	YES	YES
New Zealand Inventory of Chemicals	YES	YES	YES	YES

16. OTHER INFORMATION

16.1	Original Preparation	May 28, 1999
16.2	Revision History	Revision I, January 25, 2000, Revision 2 25 July 2011, Revision 3, GHS 24 Sep 2013, 2 Dec 2013 Section 12, minor correction
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	January 9, 2015

DEFINITIONS OF TERMS

16.5	A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:	
	Section 2	**GHS**: Global Harmonization System **OSHA:** U.S. Occupational Safety and Health Administration. **CLP**: Classification and Packaging **WHMIS**: Workplace Hazardous Materials Information System **STOT**: Specific Target Organ Toxicity
	Section 3	**CAS #:** Chemical Abstract Service index number **EINECS #:** European Chemical Substances Information System index number
	Section 5	**NFPA:** Nation Fire Protection Association **Health Hazard: 0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). **Flammability Hazard** **Reactivity Hazard:** Refer to definitions for "Hazardous Materials Identification System". **Flash Point**: Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. **Autoignition Temperature:** The minimum temperature required to initiate combustion in air with no other source of ignition. **LEL:** The lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL**: The highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.
	Section 8	**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order. **IDLH -** Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE (Not Established)** is made for reference.
	Section 11	**LD_{50}** : Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** : Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm:** Concentration expressed in parts of material per million parts of air or water; **mg/m^3** : Concentration expressed in weight of substance per volume of air; **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.
	Section 12	**LC_{50}:** The lowest concentration in water which kills 50% of the test subjects. **EC_{50}:** The Effect Concentration in water at which 50% of the test species if affected.
	Section 13	**US EPA Hazardous Waste Codes**: refer to 40 CFR 261.20
	Section 14	**DOT**: US Department of Transportation **IATA**: International Air Transport Association **IMO**: International Maritime Organization **MARPOL:** International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 **IBC Code** : Merchant Shipping Code
	Section 15	**RCRA**: US Resource Conservation and Recovery Act **SARA:** US Superfund Amendments and Reauthorization Act **PSM**: US OSHA Process Safety Management **CFATS:** US Department of Homeland Security Chemical Facility Anti-terrorism Standard **DSL:** Canadian Domestic Substances List **NDSL:** Canadian Non-Domestic Substances List **REACH**: European Registration, Evaluation, Authorization and Restriction of Chemicals list **TSCA:** US Toxic Substances Control Act

Trisodium Phosphate (T.S.P.)

SECTION 1. IDENTIFICATION

Product Identifier	Trisodium Phosphate (T.S.P.)
Other Means of Identification	12-101, 12-111, 12-116, 22-108, 32-101H, 32-111D, 32-116H, 32-117D, 82-116, 82-117
Recommended Use	Please refer to Product label.
Restrictions on Use	None known.
Manufacturer / Supplier	Recochem Inc., 850 Montee de Liesse, Montreal, QC, H4T 1P4, Compliance and Regulatory Department, 905-878-5544, www.recochem.com
Emergency Phone No.	CANUTEC, 613-996-6666, 24 Hours
SDS No.	1546

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion/irritation - Category 1A

GHS Label Elements

Signal Word:
Danger

Hazard Statement(s):
H314 Causes severe skin burns and eye damage.

Precautionary Statement(s):
Prevention:
P260 Do not breathe dusts or mists.
P264 Wash hands and skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P310 Immediately call a POISON CENTRE/doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P310 Immediately call a POISON CENTRE/doctor.
P363 Wash contaminated clothing before reuse.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310 Immediately call a POISON CENTRE/doctor.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present

and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTRE/doctor.
P321 Specific treatment (see supplemental first aid instruction on this label).
P363 Wash contaminated clothing before reuse.

Storage:
Store in a well ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Disposal:
Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

Other Hazards

Repeated exposure may cause skin dryness or cracking.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance:

Chemical Name	CAS No.	%	Other Identifiers
Phosphoric acid, trisodium salt, dodecahydrate	10101-89-0	100	Trisodium Phosphate

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move to fresh air. Remove source of exposure or move to fresh air. Keep at rest in a position comfortable for breathing. Avoid mouth-to-mouth contact by using a barrier device. Immediately call a Poison Centre or doctor.

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Take off immediately contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately rinse skin with lukewarm, gently flowing water for at least 30 minutes. Immediately call a Poison Centre or doctor. Thoroughly clean clothing, shoes and leather goods before reuse or dispose of safely.

Eye Contact

Avoid direct contact. Wear chemical protective gloves if necessary. Quickly and gently blot or brush chemical off the face. Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. Remove contact lenses, if present and easy to do. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a Poison Centre or doctor.

Ingestion

Rinse mouth with water. Do not induce vomiting. Immediately call a Poison Centre or doctor.

Most Important Symptoms and Effects, Acute and Delayed

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Immediate Medical Attention and Special Treatment

Target Organs

Digestive system, eyes, respiratory system, skin.

Special Instructions

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Medical Conditions Aggravated by Exposure

Dermatitis, respiratory conditions, skin allergies, skin conditions.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Not combustible. Use extinguishing agent suitable for surrounding fire.

Unsuitable Extinguishing Media

None known.

Specific Hazards Arising from the Chemical

Does not burn.
In a fire, the following hazardous materials may be generated: corrosive, oxidizing nitrogen oxides; corrosive phosphorous oxides.

Special Protective Equipment and Precautions for Fire-fighters

Review Section 6 (Accidental Release Measures) for important information on responding to leaks/spills.
See Skin Protection in Section 8 (Exposure Controls/Personal Protection) for advice on suitable chemical protective materials.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Use the personal protective equipment recommended in Section 8 of this safety data sheet.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway.

Methods and Materials for Containment and Cleaning Up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for Safe Storage

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Phosphoric acid, trisodium salt, dodecahydrate	Not established	Not established	Not established	Not established		

Appropriate Engineering Controls

General ventilation is usually adequate. For large scale use of this product: use local exhaust ventilation, if general ventilation is not adequate to control amount in the air. Provide eyewash and safety shower if contact or splash hazard exists.

Individual Protection Measures

Eye/Face Protection

Wear chemical safety goggles.

Skin Protection

Wear chemical protective clothing e.g. gloves, aprons, boots.
Nitrile rubber.

Respiratory Protection

Not normally required if product is used as directed. For non-routine or emergency situations: wear a NIOSH approved air-purifying respirator with an appropriate cartridge.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	White crystalline.
Odour	Odourless
Odour Threshold	Not applicable
pH	13 (100% solution)
Melting Point/Freezing Point	73.3 - 76.7 ºC (163.9 - 170.1 ºF) (melting); Not applicable (freezing)
Initial Boiling Point/Range	Not available
Flash Point	Not applicable
Evaporation Rate	Not available
Flammability (solid, gas)	Will not burn.
Upper/Lower Flammability or Explosive Limit	Not applicable (upper); Not applicable (lower)
Vapour Pressure	Not available
Vapour Density (air = 1)	Not available
Relative Density (water = 1)	1.62 at 20 ºC
Solubility	190.1 g/L (Very soluble) in water; Insoluble in alcohols (e.g. ethanol).
Partition Coefficient, n-Octanol/Water (Log Kow)	Not applicable
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
Viscosity	Not applicable (kinematic); Not applicable (dynamic)

Other Information

Physical State	Solid
Molecular Weight	380.13

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None expected under normal conditions of storage and use.

Conditions to Avoid

Generation of dust. Water, moisture or humidity.

Incompatible Materials

Forms flammable chemicals on contact with: metals (e.g. aluminum).
Not corrosive to metals.

Hazardous Decomposition Products

Corrosive phosphorous oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation; skin contact; eye contact.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Phosphoric acid, trisodium salt, dodecahydrate	Not available	7400 mg/kg (rat)	7940 mg/kg (rabbit)

LC50: Not applicable.

LD50 (oral): Not applicable.

LD50 (dermal): Not applicable.

Skin Corrosion/Irritation

Human experience and animal tests show moderate or severe irritation. Symptoms include pain, redness, and swelling. Repeated or prolonged exposure can irritate or burn the skin.

Serious Eye Damage/Irritation

Human experience and animal tests show serious eye damage. May irritate or burn the eyes. Permanent damage including blindness may result. Contact causes severe burns with redness, swelling, pain and blurred vision. Permanent damage including blindness can result.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Causes nose and throat irritation. At high concentrations causes severe nose and throat irritation.

Skin Absorption

May be harmful based on limited evidence.

Ingestion

If large amounts are swallowed severe irritation or burns to the mouth, throat and stomach.

Aspiration Hazard

Not known to be an aspiration hazard.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Causes effects similar to STOT (Specific Target Organ Toxicity) - Single Exposure, as described above. Symptoms may include dry, red, cracked skin (dermatitis).

Respiratory and/or Skin Sensitization

Not known to be a respiratory sensitizer. Not known to be a skin sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Phosphoric acid, trisodium salt, dodecahydrate	Not Listed	Not designated	Not Listed	Not Listed

Reproductive Toxicity

Development of Offspring

No information was located.

Sexual Function and Fertility

Not known to cause effects on sexual function or fertility.

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

Not known to be a mutagen.

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Phosphoric acid, trisodium salt, dodecahydrate	2400 mg/L (Pimephales promelas (fathead minnow); 48-hour)	Not available		

Chronic Aquatic Toxicity

Chemical Name	NOEC Fish	EC50 Fish	NOEC Crustacea	EC50 Crustacea
Phosphoric acid, trisodium salt, dodecahydrate	Not available		Not available	

Persistence and Degradability

No information was located.

Bioaccumulative Potential

No information was located.

Mobility in Soil

No information was located.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14. TRANSPORT INFORMATION

Not regulated under Canadian TDG Regulations. Not regulated under US DOT Regulations.

Environmental Hazards Not applicable

Special Precautions for User Not applicable

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

SECTION 16. OTHER INFORMATION

SDS Prepared By Compliance and Regulatory Department

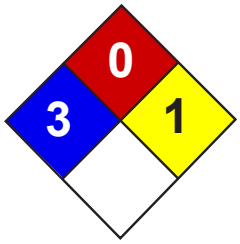
Phone No. 905-878-5544

Date of Preparation September 28, 2015

Additional Information We are committed to uphold the Industry Consumer Ingredient Communication Voluntary Initiative.
Please send us your request by visiting our website at www.recochem.com.

Ingredients present (intentionally added ingredients) at a concentration of greater than one percent (1%) shall be listed in descending order of predominance. Ingredients present at a concentration of not more than one percent shall be listed but may be disclosed without respect to order of predominance.

Disclaimer Notice to reader: To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet
Sulfamic acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfamic acid

Catalog Codes: SLS2068, SLS3490

CAS#: 5329-14-6

RTECS: WO5950000

TSCA: TSCA 8(b) inventory: Sulfamic acid

CI#: Not available.

Synonym: Amidosulfonic acid

Chemical Name: Not available.

Chemical Formula: NH2SO3H

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfamic acid	5329-14-6	100

Toxicological Data on Ingredients: Sulfamic acid: ORAL (LD50): Acute: 3160 mg/kg [Rat].

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). Hazardous in case of skin contact (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.

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). Hazardous in case of skin contact (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 Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
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 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. 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 Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

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: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

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. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate.

Section 7: Handling and Storage

Precautions:
Keep container dry. Do not ingest. Do not breathe dust. Never add water to this product 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

Storage: Corrosive materials should be stored in a separate safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

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

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 97.09 g/mole

Color: Not available.

pH (1% soln/water): 1 [Acidic.]

Boiling Point: Not available.

Melting Point: Decomposes. (205°C or 401°F)

Critical Temperature: Not available.

Specific Gravity: 2.15 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

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: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 3160 mg/kg [Rat].

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). Hazardous in case of skin contact (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.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 8: Corrosive solid.

Identification: : Sulfamic acid : UN2967 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Sulfamic acid

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

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):
R35- Causes severe burns. R43- May cause sensitization by skin contact.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection: j

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

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

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

References: Not available.

Other Special Considerations: Not available.

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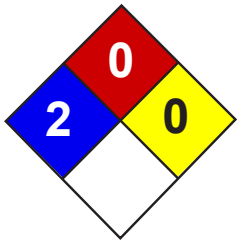
Last Updated: 05/21/2013 12:00 PM



Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Sodium metabisulfite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium metabisulfite

Catalog Codes: SLS3025

CAS#: 7681-57-4

RTECS: VZ2000000

TSCA: TSCA 8(b) inventory: Sodium metabisulfite

CI#: Not available.

Synonym: Disodium disulfite; Disodium pyrosulfite; Sodium Pyrosulfite; Sodium Metabisulphite

Chemical Name: Pyrosulfurous acid, disodium salt

Chemical Formula: Na2S2O5

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium metabisulfite	7681-57-4	100

Toxicological Data on Ingredients: Sodium metabisulfite: ORAL (LD50): Acute: 1131 mg/kg [Rat]. DERMAL (LD50): Acute: >2000 mg/kg [Rat]. >1000 mg/kg [Guinea pig].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung irritant). CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

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: Not applicable.

Special Remarks on Fire Hazards:
When heated to decomposition it emits toxic fumes of SOx, Na2O. Decomposes on heating to form sodium sulfate

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

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:
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. 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 locked up.. Do not ingest. Do not breathe dust. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Moisture sensitive. Air Sensitive

Section 8: Exposure Controls/Personal Protection

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

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 5 (mg/m3) [United Kingdom (UK)] TWA: 5 (mg/m3) from ACGIH (TLV) [United States] TWA: 5 (mg/m3) from NIOSH [United States]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystals solid or Powdered solid.)

Odor: odor of sulfur dioxide

Taste: Not available.

Molecular Weight: 190.13 g/mole

Color: White to yellowish.

pH (1% soln/water): 4.3 [Acidic.]

Boiling Point: Not available.

Melting Point: Decomposition temperature: 150°C (302°F)

Critical Temperature: Not available.

Specific Gravity: 1.4 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Easily soluble in cold water, hot water. Freely soluble in glycerol. Slightly soluble in alcohol. Moderately soluble in ethanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, heat, moisture, air, dust generation.

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Moisture sensitive Air sensitive. It slowly oxidizes to sodium sulfate upon exposure to air and moisture. Incompatible with sodium nitrite

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 1131 mg/kg [Rat]. Acute dermal toxicity (LD50): >1000 mg/kg [Guinea pig].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: upper respiratory tract, skin, eyes.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic) based on animal test data. May cause adverse reproductive effects based on animal test data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritaiton. Inhalation: May cause respiratory tract irritation with coughing and wheezing. Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation irritation with abdominal pain, nausea, vomiting, diarrhea, violent colic, and possible gastri hemorrhaging. May affect behavior/central nervous system and cause central nervous system depression/seizures. It may also affect the cardiovasular system (hypotension, tachycardia, cardiovascular collapse), Ingestion of sulfite compounds may cause a severe allergic reaction (anaphylactoid symptoms) in sensitive individuals and some asthmatics. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause allergic dermatitis. Ingestion: Prolonged or repeated ingestion may affect the liver, urinary system, and metabolism (weight loss). Future exposures may also cause asthma like allergy with coughing, shortness of breath, wheezing and/or chest tightness. Inhalation: Prolonged or repeated inhalation may irritate the lungs, may cause bronchitis to develop with cough, phlegm and/or shortness of breath.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Sodium metabisulfite Illinois toxic substances disclosure to employee act: Sodium metabisulfite Rhode Island RTK hazardous substances: Sodium metabisulfite Pennsylvania RTK: Sodium metabisulfite Minnesota: Sodium metabisulfite Massachusetts RTK: Sodium metabisulfite New Jersey: Sodium metabisulfite California Director's List of Hazardous Substances: Sodium metabisulfite TSCA 8(b) inventory: Sodium metabisulfite TSCA 4(a) ITC priority list: Sodium metabisulfite TSCA 8(a) PAIR: Sodium metabisulfite TSCA 8(d) H and S data reporting: Sodium metabisulfite: effective: 1/26/94; sunset: 6/30/98

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

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

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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