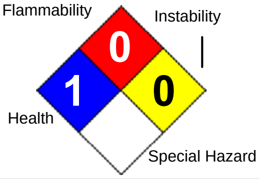
Appendix J

MATERIAL SAFETY DATA SHEET

Accent

HEALTH		1
FLAMMABILITY		0
PHYSICAL		0
PPE		B



Printed: 07/31/2012
Revision: 07/31/2012
Supercedes Revision: 12/09/2010

1. P C I

P C :	ACCENT
P N :	Accent
M I	
C N :	Washing Systems LLC 167 Commerce Boulevard Loveland, OH 45140
P N :	(513)870-4830
E C :	Chemtrec (800)424-9300
P N :	ACC045 ACC127 ACC495 ACCTOTE

2. H I

E O :	Warning! May cause eye, skin, respiratory, and digestive tract irritation. Target Organs: Eyes, skin, respiratory tract, digestive tract.
P H E A C :	Eye: May cause eye irritation. Skin: Prolonged exposure may cause skin irritation. Ingestion: May cause irritation of the digestive tract. Inhalation: May cause respiratory irritation. Chronic: None known.
LD 50 LC 50:	Refer to Section 11.
S S O E :	Eye, skin, respiratory, digestive tract irritation.
M C G A B E :	No data available.
OSHA R S :	This material is classified as not hazardous under OSHA regulations.

3. C I I

No hazardous ingredients.

4. F A M

E F A P :	Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Skin: Flush skin with plenty of soap and water. Get medical aid if irritation develops and persists. Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Give large amounts of water. Get medical aid immediately. Inhalation: Remove from exposure and move to fresh air immediately. If not

breathing, give artificial respiration. Get medical aid if irritation develops and persists.

5. F F M

F P :	NP
E L :	LEL: N.A. UEL: N.A.
A P :	NP
F F I :	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
F P H :	None known.
H C P :	Carbon monoxide. Carbon dioxide.
S E M :	Use water spray, dry chemical, carbon dioxide, or appropriate foam.
U E M :	Do NOT use straight streams of water.

6. A R M

S T B T I C M I R O S :	Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Keep unauthorized personnel away. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Following product recovery, flush area with water. Contains phosphates.

7. H S

P T B T H :	Keep container tightly closed. Use with adequate ventilation. Avoid breathing harmful vapors. Avoid ingestion and inhalation. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.
P T B T S :	Store in a cool, dry, well-ventilated area away from incompatible substances. Keep from freezing.

8. E C P P

R E S T :	Not normally required if good ventilation is maintained.
E P :	Safety glasses.
P G :	Wear appropriate protective gloves to prevent skin exposure.
O P C :	Wear appropriate protective clothing to prevent skin exposure.
E C V . :	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use with adequate ventilation.
W H M P :	Wash thoroughly after handling.

9. P C P

P S :	[ ] Gas [X] Liquid [ ] Solid
M P :	NA
B P :	NA
D T :	NA
A P :	NP
F P :	NP

S G W 1 :	1.06
D :	66.14 LB/CF
V P . A H :	NA
V D . A 1 :	NA
E R :	NA
S W :	NA
P V :	NA
S V C :	NA
V :	NA
O W P C :	NA
H:	NA
A O :	Appearance: White. Odor: Fragrant odor.

10. S R

S :	Unstable [ ] Stable [X]
C T A I :	None known.
I M T A :	Materials that react with water.
H D O B :	None known.
P H R :	Will occur [ ] Will not occur [X]
C T A H R :	Product will not undergo polymerization.

11. T I

T I :	No data available.
C T E :	No data available.
C :	NTP? No IARC Monographs? No OSHA Regulated? No

12. E I

G E I :	No data available.

13. D C

W D M :	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. T I

LAND TRANSPORT US DOT

DOT P S N	Not regulated as a hazardous material.
A T I :	No data available.

15. R I

EPA H C : This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard
[ ] Yes [X] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

16. O I

C P D

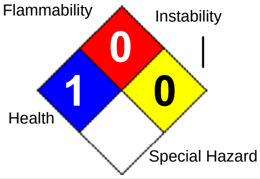
Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

N.A. N **N.P. N** **N.D. N** **N.E. N** **N.R. N**

MATERIAL SAFETY DATA SHEET

Eclipse

HEALTH	1
FLAMMABILITY	0
PHYSICAL	0
PPE	C



Printed: 09/13/2012
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1. P C I

P N :	Eclipse
M I	
C N :	Washing Systems LLC 167 Commerce Boulevard Loveland, OH 45140
E C :	Chemtrec (800)424-9300
P N :	Washing Systems LLC (513)870-4546
I U :	Laundry Detergent

2. H I

E O :	Warning! May cause eye, skin, respiratory, and digestive tract irritation. Target Organs: Eyes, skin, respiratory tract, digestive tract.
P H E A C :	Eyes: Causes eye irritation. May cause transient corneal injury. Skin. May cause irritation. May cause dermatitis. Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Inhalation: May cause irritation. Inhalation of vapors may cause drowsiness and dizziness. High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, and loss of consciousness).
LD 50 LC 50:	Refer to Section 11.
S S O E :	Nausea, vomiting, diarrhea. Drowsiness. Dizziness. Burning sensation, redness, swelling, blurred vision, coughing, difficulty breathing. Unconsciousness. Death.
M C G A B E :	None known.
OSHA R S :	This material is classified as hazardous under OSHA regulations.

3. C I I

H	C C N	CAS	C
1.	Alcohols C10-16, ethoxylated	68002-97-1	20.0 -40.0 %
2.	Dipropylene glycol methyl ether	34590-94-8	10.0 -25.0 %

4. F A M

E F A P :	Eyes: In case of contact, immediately flush eyes with plenty of water for at least {15} minutes. Get medical aid. Skin: Flush skin with plenty of soap and water. Get medical aid if irritation develops and persists. Ingestion: Do NOT induce vomiting. If swallowed, wash out mouth with water provided person is conscious. Get medical aid immediately. Inhalation: If inhaled, remove to fresh air. Get medical aid if irritation develops and persists.

5. F F M

F P :	> 698.00 F (370.0 C) Method Used: Pensky-Marten Closed Cup
E L :	LEL: N.D. UEL: N.D.
A P :	NA
F F I :	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
F P H :	Non-combustible. Container explosion may occur under fire conditions.
H C P :	Carbon monoxide. Carbon dioxide.
S E M :	Use water spray, dry chemical, carbon dioxide, or appropriate foam.
U E M :	Do NOT use straight streams of water.

6. A R M

S T B T I C M I R O S :	Use proper personal protective equipment as indicated in Section {8}. Spills/Leaks: Keep unauthorized personnel away. Keep out of low areas. Do not touch or walk through spilled material. Stay upwind. Provide ventilation. Stop leak if you can do it without risk. SMALL SPILLS: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Ventilate area and wash spill site after material pickup is complete. LARGE SPILLS: Contact emergency responder for advice.

7. H S

P T B T H :	Keep container tightly closed. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Do not breathe spray or mist. Wash thoroughly after handling. Avoid prolonged or repeated exposure.
P T B T S :	Store in a tightly closed container. Store away from incompatible substances. Prolonged stroage may cause oxygen to degradate the product.

8. E C P P

H C C N		CAS	OSHA PEL	ACGIH TWA	O L
1.	Alcohols C10-16, ethoxylated	68002-97-1	No data.	No data.	No data.
2.	Dipropylene glycol methyl ether	34590-94-8	PEL: 100 ppm; STEL 150 ppm	TLV: 100 ppm; STEL 150 ppm STEL: 150 ppm	No data.

R E S T :	Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

E P :	Chemical safety goggles.
P G :	Wear appropriate protective gloves to prevent skin exposure.
O P C :	Wear appropriate protective clothing to prevent skin exposure.
E C V . :	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
W H M P :	Wash thoroughly after handling.

9. P C P

P S :	[ ] Gas [X] Liquid [ ] Solid
M P :	NP
B P :	NA
D T :	NA
A P :	NA
F P :	> 698.00 F (370.0 C) Method Used: Pensky-Marten Closed Cup
S G W 1 :	0.99
D :	61.78 LB/CF
V P . A H :	NA
V D . A 1 :	NA
E R :	NA
S W :	Soluble
P V :	NA
S V C :	NA
V :	<=50 cP at 75.0 F (23.9 C)
O W P C :	NA
H:	6 - 8 (1%)
A O :	Appearance: Yellow. Odor: alcohol-like. Odor Threshold: {NA}

10. S R

S :	Unstable [ ] Stable [X]
C T A I :	Excess heat. Prolonged exposure to air.
I M T A :	Acids. Inorganic acids. Strong bases. Salts of strong bases. Aluminum. Strong oxidizing agents. Halogens.
H D O B :	Carbon dioxide. Carbon monoxide. Organic compounds.
P H R :	Will occur [ ] Will not occur [X]
C T A H R :	Product will not undergo polymerization.

11. T I

T I :	Ingredient: CAS# 68002-97-1 Alcohols C10-16, ethoxylated: Oral, rat: LD50 >1000 mg/kg; Dermal, rabbit: LD50 3,000-8,000 mg/kg; Inhalation, rat: LC50 0.22-8 mg/L. Ingredient: CAS # 34590-94-8 Dipropylene Glycol Methyl Ether: Oral, rat: LD50 > 2000 mg/kg. Dermal, rabbit: LD50 > 2000 mg/kg.

C T E : This product may contain trace amounts of ethylene oxide <0.1%. It is not expected to result in significant exposures or present a health hazard.

H C C N	CAS	NTP	IARC	ACGIH	OSHA
1. Alcohols C10-16, ethoxylated	68002-97-1	No	No	No	No
2. Dipropylene glycol methyl ether	34590-94-8	No	No	No	No

C : NTP? No IARC Monographs? No OSHA Regulated? No

12. E I

G E I : Ingredient: CAS# 68002-97-1: Alcohols C10-16, ethoxylated: Ecotoxicity: LC50 daphnia magna: 0.5- 2.32 mg/L 48-H. LC50 Green Algae 2.7 mg/L 72-H Toxic to aquatic organisms.

Biodegradability: OECD 301B: >60% (28 d) Readily Biodegradable.

Ingredient: CAS# 34590-94-8: Dipropylene glycol monomethyl ether: Pimephales promelas: LC50>10000 mg/L 96-H; Daphnia magna: LC50: 1919 mg/L 48-H; Log Pow=20.

13. D C

W D M : Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in {40} CFR Parts {261.3}. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. T I

LAND TRANSPORT US DOT

DOT P S N Not regulated as a hazardous material.

A T I : No data available.

15. R I

US EPA SARA T III

H C C N	CAS	S .302 EHS	S .304 R	S .313 TRI
1. Alcohols C10-16, ethoxylated	68002-97-1	No	No	No
2. Dipropylene glycol methyl ether	34590-94-8	No	No	No

EPA H C : This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard
[ ] Yes [X] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

16. O I

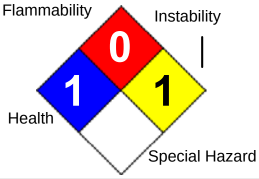
C P D

Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

N.A. N **N.P. N** **N.D. N** **N.E. N** **N.R. N**

MATERIAL SAFETY DATA SHEET
Pinnacle Liquid Antichlor

HEALTH		1
FLAMMABILITY		0
PHYSICAL		1
PPE		B



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1. P C I

P N :	Pinnacle Liquid Antichlor
M I	
C N :	Washing Systems LLC 167 Commerce Boulevard Loveland, OH 45140
E C :	Chemtrec (800)424-9300
P N :	PLA049 PLA146 PLA534 PLATOTE PLATOTE330 PLATT

2. H I

E O :	Warning! May cause eye, skin, respiratory, and digestive tract irritation. Target Organs: Eyes, skin, respiratory tract, digestive tract.
P H E A C :	Eye: May cause eye irritation. May cause chemical burn. Skin: May cause skin irritation. Ingestion: May cause irritation of the digestive tract. Inhalation: Mists can cause irritation to the respiratory tract. Chronic: Not available.
LD 50 LC 50:	Refer to Section 11.
S S O E :	Burns and irritation.
M C G A B E :	None known.
OSHA R S :	This material is classified as hazardous under OSHA regulations.

3. C I I

H C C N	CAS	C
1. Ammonium thiosulfate {Thiosulfuric acid, diammonium salt; Ammonium hyposulfite}	7783-18-8	20.0 -35.0 %

4. F A M

E F A P :	Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Skin: In case of contact, flush skin with plenty of water. Get medical aid if irritation develops and persists. Ingestion: If fully conscious, rinse mouth out with water and drink 2 glasses. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention

immediately.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if irritation develops or persists.

5. F F M

F P :	NA
E L :	LEL: N.A. UEL: N.A.
A P :	NA
F F I :	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
F P H :	Not flammable by WHMIS/OSHA criteria.
H C P :	Ammonia. Hydrogen sulfide.
S E M :	Use agent most appropriate to extinguish fire.
U E M :	None known.

6. A R M

S T B T I C M I R O S :	Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Keep unauthorized personnel away. Stop leak if you can do it without risk. Do not touch or walk through spilled material. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Small spills can be flushed to a sewer or absorbed with inert material.

7. H S

P T B T H :	Avoid breathing dust, mist, or vapor. Avoid contact with skin and eyes. Avoid ingestion and inhalation. Wash thoroughly after handling.
P T B T S :	Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from sunlight. Keep container tightly closed.

8. E C P P

H	C C N	CAS	OSHA PEL	ACGIH TLV	O L
1.	Ammonium thiosulfate {Thiosulfuric acid, diammonium salt; Ammonium hyposulfite}	7783-18-8	No data.	No data.	No data.

R E S T :	Not normally required if good ventilation is maintained.
E P :	Wear chemical splash goggles.
P G :	Wear appropriate protective gloves to prevent skin exposure.
O P C :	Wear appropriate protective clothing to prevent skin exposure.
E C V . :	Use adequate ventilation to keep airborne concentrations low. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
W H M P :	Wash thoroughly after handling.

9. P C P

P S :	[ ] Gas [X] Liquid [ ] Solid
M P :	NA

B P :	NA
D T :	NA
A P :	NA
F P :	NA
S G W 1 :	1.14
D :	71.1 LB/CF
V P . A H :	NA
V D . A 1 :	NA
E R :	NA
S W :	> 1%
P V :	NA
S V C :	NA
V :	NA
O W P C :	NA
H:	8 (1%)
A O :	Appearance: Clear. Odor: ammonia-like.

10. S R

S :	Unstable [ ] Stable [X]
C T A I :	Excess heat.
I M T A :	Strong oxidizing agents. Strong acids. Alkalis.
H D O B :	Ammonia. Hydrogen sulfide. Nitrogen oxides. Sulfur oxides (SOx).
P H R :	Will occur [ ] Will not occur [X]
C T A H R :	Product will not undergo polymerization.

11. T I

T I :	Ingredient: CAS# 7783-18-8 Ammonium Thiosulfate: Oral, rat: LD50 2890 mg/kg; Inhalation, rat: LC50 >2260 mg/m3 (4-H)
C T E :	No data available.
C O I :	CAS# 7783-18-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

H	**C C N**	**CAS**	**NTP**	**IARC**	**ACGIH**	**OSHA**
1.	Ammonium thiosulfate {Thiosulfuric acid, diammonium salt; Ammonium hyposulfite}	7783-18-8	n.a.	n.a.	n.a.	n.a.

C :	NTP? No IARC Monographs? No OSHA Regulated? No

12. E I

G E I :	Ecotoxicity: No information available.

13. D C

W D M :	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. T I

LAND TRANSPORT US DOT

DOT P S N Not regulated as a hazardous material.

A T I : No data available.

15. R I

US EPA SARA T III

H	C	C N	CAS	S .302 EHS	S .304 R	S .313 TRI
1.	Ammonium thiosulfate	{Thiosulfuric acid, diammonium salt; Ammonium hyposulfite}	7783-18-8	No	No	No

EPA H C : This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard
[ ] Yes [X] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

16. O I

C P D

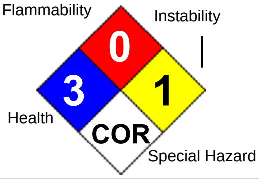
Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

N.A. N **N.P. N** **N.D. N** **N.E. N** **N.R. N**

MATERIAL SAFETY DATA SHEET

Pinnacle Liquid Sour

HEALTH		3
FLAMMABILITY		0
PHYSICAL		1
PPE		D



Printed: 07/31/2012
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Supercedes Revision: 12/30/2010

1. P C I

P N :	Pinnacle Liquid Sour
M I	
C N :	Washing Systems LLC 167 Commerce Boulevard Loveland, OH 45140
E C :	Chemtrec (800)424-9300
P N :	PLS048 PLS143 PLS324 PLS524 PLSPL PLSTOTE PLSTOTE330

2. H I

E O : Danger! Corrosive. Causes eye and skin burns. Long-term exposure may cause bone and joint changes. May cause severe respiratory tract irritation with possible burns. May be fatal if inhaled or swallowed. Absorption hazard. Aspiration hazard if swallowed.
Target Organs: Eyes, skin, respiratory tract, digestive tract. Central nervous system. Kidneys.

P H E A C : Eye: Causes eye burns. May cause chemical conjunctivitis and corneal damage. May cause blindness.

Skin: Causes skin burns. Skin Absorption: May be harmful if absorbed through the skin. It may also deplete calcium levels in the body leading to hypocalcemia and death.

Ingestion: Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause perforation of the digestive tract.

Inhalation: Causes chemical burns to the respiratory tract. Can produce delayed pulmonary edema. May cause central nervous system effects such as nausea and headache. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Fluoride can reduce calcium levels leading to fatal hypocalcemia. Effects may be delayed. May cause kidney damage.

S S O E : Burns, pain, vomiting, diarrhea, glaucoma, cataracts, dermatitis (in milder cases), ulcers, headache, dizziness, drowsiness, shortness of breath, nausea, incoordination, osteosclerosis, benign bony growths projecting outward from bone surface, calcification of ligaments, tendons, and muscle attachments to bone, shock, coma, death.

M C G A B E :	None known.
OSHA R S :	This material is classified as hazardous under OSHA regulations.

3. C I I

H	C	C N	CAS	C
1.	Flurosilicic Acid		16961-83-4	15.0 -40.0 %

4. F A M

E F A P :	Eyes: Flush eyes with plenty of water for at least 60 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. DO NOT INTERRUPT FLUSHING to transport victim. Skin: Immediately flush skin with plenty of water for at least 30 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Call a poison control center. Get medical aid immediately. Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. Get medical aid immediately.
N P :	Effects may be delayed. (up to 72-H)

5. F F M

F P :	NA
E L :	LEL: N.A. UEL: N.A.
A P :	NA
F F I :	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Additional protective clothing required, such as a chemical suit, due to corrosive nature of substance. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.
F P H :	Non-combustible. Container may explode in heat of fire.
H C P :	Hydrogen fluoride. Hydrogen gas. Silica tetrafluoride.
S E M :	Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
U E M :	If water is used, care should be taken, since it can generate heat and cause spattering if applied directly.

6. A R M

S T B T I C M I R O S :	Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Keep unauthorized personnel away. Do not touch or walk through spilled material. Provide ventilation. Stop leak if you can do it without risk. Contact emergency responder for advice.

7. H S

P T B T H :	Use with adequate ventilation. Do not breathe dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Do not ingest or inhale. Discard contaminated shoes.
P T B T S :	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from sunlight.

8. E C P P

H	C	C N	CAS	OSHA PEL	ACGIH TLV	O L
1.	Flurosilicic Acid		16961-83-4	2.5 mg/m3 (as F)	2.5 mg/m3 (as F)	No data.

R E S T :	Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use.
E P :	Goggles and face shield.
P G :	Wear appropriate protective gloves to prevent skin exposure.
O P C :	Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear appropriate protective clothing to prevent skin exposure. Full protective clothing or suit recommended.
E C V . :	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.
W H M P :	Wash thoroughly after handling.

9. P C P

P S :	[ ] Gas [X] Liquid [ ] Solid
M P :	NA
B P :	NA
D T :	NA
A P :	NA
F P :	NA
S G W 1 :	1.23
D :	76.8 LB/CF
V P . A H :	NA
V D . A 1 :	NA
E R :	NA
S W :	> 1 %
P V :	NA
S V C :	NA
V :	NA
O W P C :	NA
H:	2.3 (1%)
A O :	Appearance: Yellowish. Brownish. Odor: pungent odor.

10. S R

S :	Unstable [ ] Stable [X]
C T A I :	Open flame. Ignition sources. Moisture. Excess heat.
I M T A :	Glass. Strong oxidizing agents. Metals. Alkalis. Combustible materials. Strong bases. Water. Hydrogen peroxide.
H D O B :	Irritating and toxic fumes and gases. Hydrogen fluoride gas. Silica tetrafluoride. Hydrogen gas.
P H R :	Will occur [ ] Will not occur [X]
C T A H R :	Product will not undergo polymerization.

11. T I

T I :	CAS# 16961-83-4 Fluorosilicic Acid: Oral, rat: LD50 125 mg/kg-430 mg/kg.
C T E :	No data available.
C O I :	A4: Not classifiable as a human carcinogen.

H C C N	CAS	NTP	IARC	ACGIH	OSHA
1. Flurosilicic Acid	16961-83-4	No	No	A4	No

C :	NTP? No IARC Monographs? No OSHA Regulated? No

12. E I

G E I :	Toxic to aquatic organisms.

13. D C

W D M :	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. T I

LAND TRANSPORT US DOT

DOT P S N	FLUOROSILICIC ACID. (Solution)
DOT H C :	8
DOT H L :	CORROSIVE
UN NA N :	UN1778
P G :	II
A T I :	No data available.

15. R I

US EPA SARA T III

H C C N	CAS	S .302 EHS	S .304 R	S .313 TRI
1. Flurosilicic Acid	16961-83-4	No	No	No

EPA H C :	This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated: [X] Yes [ ] No Acute (immediate) Health Hazard

[X] Yes [ ] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[X] Yes [ ] No Reactive Hazard

16. O I

C P D

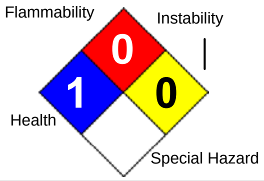
Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

N.A. N **N.P. N** **N.D. N** **N.E. N** **N.R. N**

MATERIAL SAFETY DATA SHEET

Structure

HEALTH	☐	1
FLAMMABILITY		0
PHYSICAL		0
PPE		B



Printed: 07/01/2013
Revision: / /

1. PRODUCT AND COMPANY IDENTIFICATION

P N : Structure

M I

C N : Washing Systems LLC
167 Commerce Boulevard
Loveland, OH 45140

P N : (513)870-4830

E C : Chemtrec (800)424-9300

P N : Washing Systems LLC (513)870-4546

I U : Builder/Water Conditioning Agent

D : 07/01/2013

2. HAZARDS IDENTIFICATION

E O : Warning! May cause eye, skin, respiratory, and digestive tract irritation.

P H E A C : Eyes: May cause eye irritation.

Skin: May cause irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause swelling and tissue destruction to the mucous membranes of the mouth, throat, esophagus, and stomach.

Inhalation: May cause irritation. May cause difficulty breathing, coughing, choking, pain, and possible burns of the mucous membranes. Irritation may lead to chemical pneumonitis and pulmonary edema. Can produce delayed pulmonary edema.

LD 50 LC 50: Refer to Section 11.

S S O E : Tightness of chest. Dizziness. Nausea, vomiting, diarrhea. Irritation.

M C G A B E : No data available.

OSHA R S : This material is classified as hazardous under OSHA regulations.

3. COMPOSITION INFORMATION ON INGREDIENTS

H	C C N	CAS	C
1.	L-Glutamic acid, N,N-diacetic acid tetrasodium salt	51981-21-6	10.0 -20.0 %
2.	Potassium hydroxide {Caustic potash}	1310-58-3	< 2.0 %
3.	Sodium Silicate	1344-09-8	15.0 -40.0 %

4. FIRST AID MEASURES

E F A P :

I C I : Remove to fresh air. Get medical aid if irritation develops and persists.

I C S C : Wash with soap and water. Get medical aid if irritation develops and persists.

I C E C : Flush eyes with plenty of water for at least {15} minutes, occasionally lifting the upper and lower eyelids. Get medical aid if irritation develops and persists.

I C I : Do NOT induce vomiting. Give large amounts of water. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward. Get medical aid immediately.

5. FIRE FIGHTING MEASURES

F P : >= 200 F (93.3 C) Method Used: Closed Cup

E L : LEL: N.A. UEL: N.A.

A P : NP

F F I : As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

F P H : None known.

H C P : Nitrogen oxides. Oxides of carbon. Ammonia. Corrosive and toxic fumes. Sodium hydroxide.

S E M : Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

U E M : None known.

6. ACCIDENTAL RELEASE MEASURES

S T B T I C M I R O S : Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Keep unauthorized personnel away. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Provide ventilation. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Following product recovery, flush area with water.

7. HANDLING AND STORAGE

P T B T H : Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Wash thoroughly after handling.

P T B T S : Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

8. EXPOSURE CONTROLS PERSONAL PROTECTION

H	C C N	CAS	OSHA PEL	ACGIH TWA	O L
1.	L-Glutamic acid, N,N-diacetic acid tetrasodium salt	51981-21-6	No data.	No data.	No data.
2.	Potassium hydroxide {Caustic potash}	1310-58-3	No data.	CEIL: 2 mg/m3	No data.
3.	Sodium Silicate	1344-09-8	No data.	No data.	No data.

R E S T : Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

E P :	Safety glasses.
P G :	Wear appropriate protective gloves to prevent skin exposure. Preferred glove barrier materials include: Butyl rubber, natural rubber, neoprene, nitrile or viton.
O P C :	Wear appropriate protective clothing to prevent skin exposure.
E C V . :	Use adequate ventilation to keep airborne concentrations low.
W H M P :	Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

P S :	[ ] Gas [X] Liquid [ ] Solid
F P :	< 0 C (32.0 F)
B P :	100 C (212 F) - 115 C (239 F)
D T :	NP
A P :	NP
F P :	>= 200 F (93.3 C) Method Used: Closed Cup
S G W 1 :	1.2
D :	10.0 lb/gal
V P . A H :	150 MM_HG at 60.0 C (140 F)
V D . A 1 :	NA
E R :	NA
S W :	Miscible
P V :	NA
S V C :	NA
V :	< 50 cP
O W P C :	NA
H:	10 - 11 (1%)
A O :	Appearance: Clear. green. Odor: Odorless. Odor Threshold: {NA}

10. STABILITY AND REACTIVITY

S :	Unstable [ ] Stable [X]
C T A I :	Moisture.
I M T A :	Acids. Metals. Fluorine. Aluminum. Lead. Tin. Zinc. Brass. Other alkali sensitive metals or alloys. Copper alloys. Copper. Bronze. Nickel. Halogenating Agents. Flammable liquids.
H D O B :	Carbon dioxide. Carbon monoxide. Nitrogen oxides. Ammonia.
P H R :	Will occur [ ] Will not occur [X]
C T A H R :	Product will not undergo polymerization.

11. TOXICOLOGICAL INFORMATION

T I : Ingredient: CAS# 51981-21-6 L-Glutamic acid, N,N-diacetic acid tetrasodium salt:
Oral, rat: LD50 >2000 mg/kg. (based on tests with a similar product). Dermal toxicity: Not irritating to rabbit skin after 4-hr exposure to 164 mg. (Primary irritation index was 0.0) based on tests with a similar product. Eye: Minimally irritating to rabbit eyes following instaillation of 31 mg. (Maximum irritation score was 3.3) based on tests with a similar product.

Ingredient: CAS# 1310-58-3 Potassium Hydroxide:
Oral, rat: LD50 205-365 mg/kg; Dermal, rabbit: LD50 >1260 mg/kg.

Ingredient: CAS# 1344-09-8 Sodium Silicate:
Oral, rat: LD50 1153 mg/kg. Dermal, rabbit: LD50 4640 mg/kg.

C T E : CAS# 51981-21-6 L-Glutamic acid, N,N-diacetic acid tetrasodium salt: 90-day oral gavage study on a similar product induced reversible changes in some blood and urine parameters without concomitant microscopic changes in the kidneys or other organs. The NOAEL is 300 mg/kg/day.

Mutagenicity: A similar product was negative in the Ames, CHO HGPRT forward mutation and micronucleus tests. It was weakly clastogenic to CHL cells in vitro.

H C C N		CAS	NTP	IARC	ACGIH	OSHA
1.	L-Glutamic acid, N,N-diacetic acid tetrasodium salt	51981-21-6	No	No	No	No
2.	Potassium hydroxide {Caustic potash}	1310-58-3	No	No	No	No
3.	Sodium Silicate	1344-09-8	No	No	No	No

C : NTP? No IARC Monographs? No OSHA Regulated? No

12. ECOLOGICAL INFORMATION

G E I : Ingredient: CAS 51981-21-8 L-glutamic acid, N,N-diacetic acid tetrasodium salt: EC50, dapnia magna >100 mg/L (48-h); EC50, algae >100 mg/L (72-h); LC50, rainbow trout >100 mg/L (96-h) Bioaccumulation: Low potential.

CAS# 1310-58-3 Potassium Hydroxide:
LC50 daphnia magna: 60 mg/L 48-Hr. LC50 Green Algae 61 mg/L 96-Hr LC50 fathead minnue: 179 mg/L 96-Hr

13. DISPOSAL CONSIDERATIONS

W D M : Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in {40} CFR Parts {261.3}. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. TRANSPORT INFORMATION

LAND TRANSPORT US DOT

DOT P S N Not regulated as a hazardous material.

A T I : No data available.

15. REGULATORY INFORMATION

EPA H C : This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard
[ ] Yes [X] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

16. OTHER INFORMATION

C P D

Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

N.A. N **N.P. N** **N.D. N** **N.E. N** **N.R. N**

Brenntag Canada Inc. **BRENNTAG**

MATERIAL SAFETY DATA SHEET

CAUSTIC SODA LI UID 10 50 8589 9028 9101

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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

WHMIS#:	00060114
Index:	GCD1716/13A
Effective Date:	2013 January 04
Date of Revision:	2013 January 04

Website: http://www.brenntag.ca

EMERGENCY TELEPHONE NUMBER F E I C S R

1 855 273 6824

PRODUCT IDENTIFICATION

Product Name:	Caustic Soda, Liquid, 10 - 50 % (8589, 9028, 9101).
Chemical Name:	Sodium Hydroxide.
Synonyms:	Lye; Soda Lye; Caustic Soda 10 %, 12 %, 15 %, 16 %, 16.6 %, 18 %, 20 %, 21 %, 25 %, 30 %, 31 %, 33 %, 34. 67 % 40 %, 50 %. Grade(s): Caustic Soda 50 % Diaphragm; Caustic Soda 50 % Membrane; Caustic Soda Rayon.
Chemical Family:	Hydroxide. Sodium salts.
Molecular Formula:	NaOH.
Product Use:	Cleaner. Metal treatment. Water treatment. pH control of water. Neutralizing agent in the petroleum industry. Laboratory reagent. Pulp and paper industry. Chemical intermediate.

WHMIS C S :

E: Corrosive

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*
Sodium Hydroxide	1310-73-2	—	10 - 50
Sodium Chloride	7647-14-5	---	0 - 2

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Corrosive! Harmful if inhaled, absorbed through skin, or swallowed. Causes severe skin and eye burns. Prolonged or repeated exposure may cause discoloration and erosion of teeth. Vapours are extremely irritating to eyes and respiratory tract. See "Other Health Effects" Section. This product is often transported and handled hot. Contact with heated material may cause thermal burns. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation:	Corrosive! Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Toxic effects may be delayed. Airborne concentration of dust, mist or spray may cause damage to the lung tissue which could produce chemical pneumonia. Can cause injury to entire respiratory tract. See "Other Health Effects" Section.
Skin Contact:	Corrosive! Burns (chemical) can occur if not promptly removed. Concentrated solutions may cause pain and deep and severe burns to the skin. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin. Prolonged and repeated contact may lead to dermatitis.
Skin Absorption:	Corrosive! Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin. Burns (chemical) can occur if not promptly removed.
Eye Contact:	Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur. Prolonged and repeated exposure may cause visual disturbances.
Ingestion:	Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur.
Other Health Effects:	Corrosive effects 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. May cause chemical pneumonitis bluish lips and skin pulmonary oedema. Pulmonary oedema is 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. (4) Corrosive to all body tissues with which it comes in contact. The effect of local dermal exposure may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness. These effects occur only when the TLV is exceeded. (3) Regardless of concentrations, the severity of damage and extent of its irreversibility increases with length of contact time. Prolonged contact with even dilute Sodium Hydroxide solution can cause a high degree of tissue destruction. The latent period, following skin contact during which no sensation of irritation occurs, varies from several hours for 0.4-4% solution to 3 minutes with 25-50% solution. (3)

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.
Skin Contact:	Prompt removal of the material from the skin is essential for all concentrations, whether as a solid, or a concentrated or dilute solution. (3) Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of soap and water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. Cover the exposed part with a clean, preferably sterile, lint-free dressing. Obtain medical attention IMMEDIATELY and monitor breathing and treat for shock for severe exposure.
Eye Contact:	Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.
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. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain medical attention IMMEDIATELY. DO NOT give acidic agents (e.g., citrus juices or vinegar) to "neutralize" the alkali. This action may cause an exothermic reaction and burn the esophagus.

Note to Physicians:	Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation. 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. Medical conditions that may be aggravated by exposure to this product include diseases of the skin, eyes or respiratory tract.

5. FIRE-FIGHTING MEASURES

		F L A :	
Flashpoint (°C)	***AutoIgnition Temperature (°C)***	***LEL***	***UEL***
Non-combustible (does not burn).	Not applicable.	Not applicable.	Not applicable.

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include oxides of sodium.
Unusual Fire or Explosion Hazards:	Not normally a fire hazard. Water content of product prevents ignition. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air. Closed containers exposed to heat may burst. Spilled material may cause floors and contact surfaces to become slippery.
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 media appropriate for surrounding fire and/or materials.
FIRE FIGHTING INSTRUCTIONS	
Instructions to the Fire Fighters:	Isolate materials that are not involved in the fire and protect personnel. Remove containers from fire zone whenever possible.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing. Protective clothing for skin and eye protection should be worn to protect against highly alkaline materials. See section 8.

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:	See Section 13, "Deactivating Chemicals". In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes 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. Spilled material may cause floors and contact surfaces to become slippery. Wear respirator, protective clothing and gloves. A chemical splash suit should be used when necessary to prevent skin contact with highly corrosive liquids. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere.

7. HANDLING AND STORAGE

HANDLING

Handling Practices:	Use normal "good" industrial hygiene and housekeeping practices. Containers 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. A chemical splash suit should be used when necessary to prevent skin contact with highly corrosive liquids. When diluting, add this material/product to water in small amounts to avoid spattering. Never add water to this material/product. The water should be lukewarm. Never start with hot or cold water. Add small quantities of this material slowly to large quantities of water, stirring constantly all the while. Constant stirring is necessary to avoid concentration of the product at the bottom of the mix vessel. Such concentration of the product may result in a violent exotherm with boiling of the liquid resulting in splashing, spattering or a violent eruption of a highly corrosive solution if the addition is too rapid or without sufficient stirring. Clean all containers of residues before adding the product. This will avoid potential violent reaction with unknown residues. (3)
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing aerosols (vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use.

STORAGE

Storage Temperature (°C):	See below.
Ventilation Requirements:	Ventilation should be corrosion proof.
Storage Requirements:	Hazardous carbon monoxide can form upon contact with food and beverage products in enclosed spaces and can cause death. Do not store near oxidizing agents or acids. 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. Storage tanks should be in a contained area to control any spills or leaks. Corrosive mist is most likely to be generated at the vents of process or storage tanks, especially during filling operations. The use of compressed air to force corrosive materials from delivery trucks is of special concern. Scrubbing the exhaust of these vents is highly recommended. Jurisdictional regulations should be consulted to determine required practices. Protect from direct sunlight. Protect against physical damage.
Special Materials to be Used for Packaging or Containers:	Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air. Equipment for storage, handling or transportation should NOT be made of: aluminum, copper, zinc, tin, lead, bronze, brass, Chromium and Magnesium. Attacks some types of rubber, plastics and coatings. 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. Ventilation should be corrosion proof. 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 to prevent eye contact. Use full face-shield and 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 butyl rubber, neoprene, natural rubber, nitrile rubber or PVC should be impervious under conditions of use. Discard contaminated gloves. Prior to use, user should confirm impermeability. Do not use gloves or protective clothing made from polyvinyl alcohol (PVA). Exposed skin areas should be protected as appropriate whenever the potential for skin contact exists (consider long sleeves, gloves, aprons, etc.).
Respiratory Protection:	No specific guidelines available. A NIOSH/MSHA-approved full facepiece air-purifying respirator equipped with dust, mist, fume cartridges for concentrations up to 10 mg/m³. An air-supplied respirator if concentrations are higher or unknown. Immediately Dangerous to Life and Health (IDLH) value: 10 mg/m³. The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory equipment. In the event of failure of respiratory protective equipment, every effort should be made to exit immediately. (4)
Other Personal Protective Equipment:	Wear an impermeable apron and boots. A chemical splash suit should be used when necessary to prevent skin contact with highly corrosive liquids. 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)***
Sodium Hydroxide	2 mg/m³ (Ceiling)	2 mg/m³	---	---	2 mg/m³ (Ceiling)

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

Physical State:	Liquid.
Appearance:	Clear, colourless liquid.
Odour:	Odourless
Odour Threshold (ppm):	Not available.
Boiling Range (°C):	140 - 144 (50 %). (3)
Melting/Freezing Point (°C):	5 - 12 (50 %). (3)
Vapour Pressure (mm Hg at 20° C):	1.5 (50 %). (3)
Vapour Density (Air = 1.0):	Not available.
Relative Density (g/cc):	1.11 (10 %); 1.22 (20 %); 1.33 (30 %); 1.43 (40 %); 1.53 (50 %). (3)
Bulk Density:	1 110 - 1 530 kg/m³.
Viscosity:	Not available.
Evaporation Rate (Butyl Acetate = 1.0):	Not available.
Solubility:	Soluble in water.
% Volatile by Volume:	Not available.
pH:	14.0 (5 % solution). (3)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not available.
Flashpoint (°C):	Non-combustible (does not burn).

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. Avoid moisture contamination. Avoid direct contact of this product with water as this can cause a violent exothermic reaction. Keep tightly closed to protect quality.

Materials to Avoid:	Strong oxidizing and reducing agents. Halogenated compounds. Trichloroethylene. Nitromethane. Violently reactive with: aldehydes, organic materials and Acids. Organic materials. Combustibles. Organic Halides Strong bases. May react with organohalogen compounds to form spontaneously combustible compounds. May react explosively with nitro- and chloro-organic compounds, glycols and organic peroxides. Violently polimerizes acetaldehyde, acrolein, and acrytonitrile. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air. Solutions are slightly corrosive to metals. Aluminum and its alloys Zinc and its alloys. Copper and its alloys. Tin. Galvanized Materials. Bronze. Brass. Lead. Chromium. Magnesium. Alkali metals. Attacks some types of rubber, plastics and coatings. Potentially deadly carbon monoxide gas can form in enclosed areas or enclosed tanks when alkaline products contact food or beverage products that contain sugars. (3)
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include oxides of sodium.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Sodium Hydroxide	---	1 350 mg/kg (3)	---

Carcinogenicity Data:	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP. See "Other Studies Relevant to Material".
Reproductive Data:	No adverse reproductive effects are anticipated.
Mutagenicity Data:	No adverse mutagenic effects are anticipated.
Teratogenicity Data:	No adverse teratogenic effects are anticipated.
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	None known.
Other Studies Relevant to Material:	Many publications in the scientific literature confirm the severely irritating properties of acute and short-term exposure to Sodium Hydroxide in humans and animals and discuss toxic effects (such as death, eye damage or changes in lung morphology), which are probably related to the corrosive properties of this compound. (3) Inhalation of unmeasured concentrations 30 minutes per day for 2.5 months resulted in lung damage in rats. A rodent drinking water study at 1% (duration unknown) was reported to result in "nervous symptoms" and growth retardation. Growth was unaffected in this same study at 0.5%, but no conceptions occured. (3) No tumors were seen in any longer term animal studies. Sodium Hydroxide produced no genetic changes in standard tests using bacterial cells. No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dusts for 30 years or more. (3) Massive ingestion of Sodium Hydroxide has been implicated as causing esophageal cancer. Squamous cells carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of Sodium Hydroxide. (3)

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Toxicity is primarily associated with pH. This product is toxic to Aquatic Life. Sodium Hydroxide: LC50 (24-hr) = 25 ppm (Brook trout). (3) LC50 (48-hr) = 33 - 100 ppm (Shrimp). (3) LC50 (48-hr) = 220 - 1000 ppm (Cockle). (3)

Environmental Fate:	This material is not expected to bioaccumulate. (3) Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. Sodium Hydroxide has no biological oxygen demand. (3) There is limited information available on the environmental fate and effects of Sodium Hydroxide. Laboratory toxicity data indicate that Sodium Hydroxide is moderately toxic to aquatic and terrestrial organisms. The primary mode of action is due to the corrosive nature of this chemical and its tendency to increase pH in poorly buffered environments. Aquatic organisms become increasingly stressed as pH exceeds 9, with many aquatic species being intolerant of pH levels in excess of 10. Increased pH due to the introduction of Sodium Hydroxide into aquatic environments may lead to the precipitation of essential micronutrients. Exposed terrestrial species would be subject to skin irritation and burns due to the corrosive nature of this material. Due caution should be excercised to prevent the accidental release of this material to aquatic or terrestrial environments. (3)

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	Neutralize carefully with weak acid to a pH of 6 to 9. Neutralization is expected to be exothermic. Effervescence may result. Add a liberal covering of sodium bicarbonate. Confirm pH using pH paper.
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 dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Treat package in the same manner as the product.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

SODIUM HYDROXIDE SOLUTION, Class 8, UN1824, PG II.

Label(s): Corrosives. Placard: Corrosives.

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

US DOT CLASSIFICATION 49CFR 172.101 172.102 :

SODIUM HYDROXIDE SOLUTION, Class 8, UN1824, PG II.

Label(s): Corrosive. Placard: Corrosive.

CERCLA-RQ: 1 000 lb / 454 kg. Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR:	All components of this product are included on the DSL.
CEPA - NPRI:	Not included.

Controlled Products Regulations Classification (WHMIS):

E: Corrosive

USA

Environmental Protection Act:	All components of this product are included on the TSCA inventory.
OSHA HCS (29CFR 1910.1200):	Corrosive.

NFPA: 3 Health, 0 Fire, 1 Reactivity (3)
HMIS: 3 Health, 0 Fire, 1 Reactivity (3)

INTERNATIONAL

Sodium Hydroxide is found on the following inventories: EINECS (European Inventory of Existing Commercial Chemical Substances), Australia (ACOIN), Japan (MITI) and Korea (ECL).

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.

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

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

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Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

KATHON™ LM Microbicide

Product Use Description Biocidal product

Revision date: 11/04/2010

Supplier

ROHM AND HAAS CANADA LP
A Subsidiary of The Dow Chemical Company
2 MANSE ROAD
WEST HILL, ON M1E 3T9 Canada

Manufacturer

Rohm and Haas Company
100 Independence Mall West
Philadelphia, PA 19106-2399 United States of America

Prepared by: Prepared for use in Canada by EH&S, Hazard Communications.
Preparation date: 11/04/2010
For MSDS Updates and Product Information: 800-258-2436
Emergency telephone number
989-636-4400
Local Emergency telephone number
989-636-4400

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form	liquid
Colour	Pale yellow clear
Odour	Sweet odor

Hazard Summary

DANGER!
CORROSIVE
CAUSES SEVERE EYE/SKIN BURNS.
MAY CAUSE SENSITIZATION BY SKIN CONTACT.
IRRITATING TO RESPIRATORY SYSTEM.

Potential Health Effects

Primary Routes of Entry: Inhalation
Eye contact

Skin contact

Eyes: Material can cause the following:
corrosion to eyes
May cause permanent eye injury.

Skin: Material can cause the following:
corrosion to the skin
burns
May cause sensitization of susceptible persons by skin contact.

Ingestion: May be harmful if swallowed.
Inhalation: Inhalation of vapor or mist can cause the following:
irritation of nose, throat, and lungs

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight percent
2-n-Octyl-4-isothiazolin-3-one	26530-20-1	5.0 - 6.0 %
Propanediol	57-55-6	94.0 - 95.0 %
Related reaction products	Trade secret	0.0 - < 0.1 %

4. 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.
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. FIRE-FIGHTING MEASURES

Flash point	107 °C (224.60 °F)
Ignition temperature	371.0 °C (699.80 °F) Propylene glycol
Lower explosion limit	2.60 %(V)Propylene glycol
Upper explosion limit	12.50 %(V)Propylene glycol

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.
Specific hazards during fire fighting: Combustion generates toxic fumes of the following: nitrogen oxides (NOx) sulfur oxides
Special protective equipment for fire-fighters: Wear self-contained breathing apparatus and protective suit.
Further information: Cool containers / tanks with water spray.

Minimize exposure.
Do not breathe fumes.
Contain run-off.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
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.
Methods for 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

Handling
This material is corrosive. For personal protection see section 8. Do not handle material near food, feed or drinking water.

Storage
Storage conditions: Keep in a well-ventilated place. Store in a cool and shaded area. Do not store this material in containers made of the following: steel Do not store this material near food, feed or drinking water. Keep container tightly closed.
Further information on storage conditions: 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 temperature: >= 1 ℃ (>= 34 ℉)
Storage temperature: <= 37 ℃ (<= 99 ℉)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)
Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value
2-n-Octyl-4-isothiazolin-3-one	Rohm and Haas	TWA	0.2 mg/m3
	Rohm and Haas	STEL	0.6 mg/m3

Component	Regulation	Type of listing	Value
Propanediol	Rohm and Haas	TWA	175 ppm
	WEEL	TWA Aerosol.	10 mg/m3

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Form	liquid
Colour	Pale yellow clear
Odour	Sweet odor
pH	2.4 (10% solution)
Boiling point/boiling range	188 °C (370.40 °F)
Melting point/range	-48.00 °C (-54.40 °F)
Flash point	107 °C (224.60 °F)
Ignition temperature	371 °C (699.80 °F) Propylene glycol
Lower explosion limit	2.60 %(V)Propylene glycol
Upper explosion limit	12.50 %(V)Propylene glycol
Vapour pressure	0.1 mmHg at 25 °C (77.00 °F) Propylene glycol
Relative vapour density	>1.0
Water solubility	Highly soluble
Partition coefficient: n-octanol/water	log Pow: 2.45 Calculated
Relative density	1.03 at 20.00 °C (68.00 °F) estimated
Viscosity, dynamic	40.000 mPa.s at 20.00 °C (68.00 °F)

Evaporation rate	<1.00
Percent volatility	95 %

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

10. STABILITY AND REACTIVITY

Hazardous reactions	Stable under recommended storage conditions.
Materials to avoid	Avoid contact with the following: Oxidizing agents Amines Reducing agents mercaptans
Hazardous decomposition products	nitrogen oxides (NOx), Sulphur oxides, hydrogen chloride,
polymerisation	Product will not undergo polymerization.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD50 rat female >5,000 mg/kg
Acute inhalation toxicity	LC50 rat 4 h >1.95 mg/l
Acute dermal toxicity	LD50 rabbit >2,000 mg/kg
Skin irritation	rabbit Corrosive
Eye irritation	rabbit Corrosive
Sensitisation	guinea pig Causes sensitization.

Carcinogenicity:
Did not show carcinogenic effects in animal experiments.
Carcinogenicity:
Active ingredient
Teratogenicity
Did not show teratogenic effects in animal experiments.
Teratogenicity
Active ingredient
Mutagenicity
Non-mutagenic
Mutagenicity
Active ingredient

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Physico-chemical removability	Activated Sludge Respiration Inhibition EC50: 47 mg/l ai

Ecotoxicity effects

Toxicity to fish	LC50 Oncorhynchus mykiss (rainbow trout) 96 h OECD Test Guideline 203 0.047 mg/l Active ingredient
Toxicity to fish	LC50 Lepomis macrochirus (Bluegill sunfish) 96 h OECD Test Guideline 203 0.18 mg/l Active ingredient
Toxicity to algae	EC50 Algae (Selenastrum capricornutum) 72 h OECD Test Guideline 201 0.031 mg/l Active ingredient
Toxicity to aquatic invertebrates	EC50 Daphnia magna 48 h FIFRA 77-2 0.32 mg/l Active ingredient

13. DISPOSAL CONSIDERATIONS

Disposal

Waste Classification: When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).
Incinerate liquid and contaminated solids in accordance with local, state, and federal regulations. (See 40 CFR 268)

14. TRANSPORT INFORMATION

DOT/TDG

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

IMO/IMDG

Proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(2-n-Octyl-4-isothiazolin-3-one)
UN number	UN 3265
Class	8
Packing group	II
Marine pollutant	2-n-Octyl-4-isothiazolin-3-one

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification

OSHA:	This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).
WHMIS:	This product is subject to regulation under the Canadian Pest Control Products Act (P.C.P. Act). Therefore, this product is excluded from the supplier labeling and material safety data sheet requirements as specified in Section 12 of the Hazardous Products Act.

WHMIS Classification

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

Canada. Environmental Protection Act (DSL): All components of this product are in compliance with the inventory listing requirements of the New Substances Notification Regulations.

US. Toxic Substances Control Act (TSCA): This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and is therefore exempt from U.S. Toxic Substances Control Act (TSCA) Inventory listing requirements.

16. OTHER INFORMATION

HMIS Hazard Rating

Health	Fire	Reactivity	Physical Hazard	PPE
3	0	0		

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAc	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
|	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Version: 2.1
Print Date: 05/01/2012

Layout 000101080174

FICHE DE DONNEES DE SECURITE

1. IDENTIFICATION DU PRODUIT ET DE LA SOCIETE

KATHON™ LM Microbicide

Utilisation du produit	Produit biocide

Date de révision: 11/04/2010

Fournisseur

ROHM AND HAAS CANADA LP
A Subsidiary of The Dow Chemical Company
2 MANSE ROAD
WEST HILL, ON M1E 3T9 Canada

Fabricant

Rohm and Haas Company
100 Independence Mall West
Philadelphia, PA 19106-2399 USA

Préparé par: Pour utilisation au Canada, préparé par les Services de communication de renseignements sur les dangers - Environnement, santé et sécurité.
Date de préparation:: 11/04/2010
Pour une mise à jour de la fiche ou de l'information sur le produit: 800-258-2436
Numéro d'appel d'urgence
989-636-4400
Local Numéro d'appel d'urgence
989-636-4400

2. IDENTIFICATION DES DANGERS

Informations générales en cas d'urgence

Aspect

Forme	liquide
Couleur	Jaune pâle clair
Odeur	Odeur agréable

Résumé des dangers	**DANGER!** CORROSIF CAUSE DES BRULURES SEVERES DES YEUX ET DE LA PEAU. PEUT ENTRAINER UNE SENSIBILISATION PAR CONTACT AVEC LA PEAU. IRRITANT POUR LES VOIES RESPIRATOIRES.

Effets potentiel sur la santéé

Voies d'exposition principales:	Inhalation Contact avec les yeux Contact avec la peau

Yeux: Le produit peut causer les effets suivants :
corrosif pour les yeux
Peut causer des blessures permanentes aux yeux.

Peau: Le produit peut causer les effets suivants :
- corrosif pour la peau
brûlures
Peut provoquer la sensibilisation des sujets prédisposés par contact avec la peau.
Ingestion: Peut être nocif par ingestion.
Inhalation: L'inhalation des vapeurs ou brouillards peut avoir les effets suivants:
irritation des voies respiratoires

3. COMPOSITION/INFORMATIONS SUR LES COMPOSANTS

Composant	No.-CAS	Pour cent en poids
2-octyl-2H-isothiazole-3-one	26530-20-1	5.0 - 6.0 %
Propylène glycol	57-55-6	94.0 - 95.0 %
Related reaction products		0.0 - < 0.1 %

4. PREMIERS SECOURS

Inhalation: Amener la victime à l'air libre. En cas d'arrêt respiratoire, pratiquer la respiration artificielle. Si les troubles se prolongent, consulter un médecin.
Contact avec la peau: Se rincer IMMEDIATEMENT sous une douche. Enlever les vêtements contaminés. Laver avec de l'eau et du savon. Un examen médical immédiat est requis. Laver les vêtements contaminés avant une nouvelle utilisation. Ne pas emporter les vêtements à laver à la maison. Eliminer les chaussures souillées, ceintures etautres articles en cuir.
Contact avec les yeux: Laver immédiatement et abondamment à l'eau pendant au moins 15 minutes. Un examen médical immédiat est requis.
Ingestion: Boire 1 ou 2 verres d'eau. Consulter immédiatement un medecin. Ne jamais rien faire avaler à une personne inconsciente.
Avis aux médecins: CE PRODUIT EST CORROSIF. Le vomissement n'est pas recommandé. D'éventuelles lésions des muqueuses peuvent contre-indiquer la nécessité d'un lavage d'estomac. Prendre toutes mesures pour éviter convulsions et choc respiratoire.

5. MESURES DE LUTTE CONTRE L'INCENDIE

Point d'éclair	107 °C (224.60 °F)
Température d'inflammation	371.0 °C (699.80 °F) Propylène glycol
Limite d'explosivité, inférieure	2.60 % (v)Propylène glycol
Limite d'explosivité, supérieure	12.50 % (v)Propylène glycol

Moyens d'extinction appropriés: Employer des moyens d'extinction adaptés au feu environnant.

Dangers spécifiques pendant la lutte contre l'incendie: La combustion dégage des fumées toxiques pouvant contenir : oxydes d'azote (NOx) oxydes de soufre
Équipement de protection spécial pour le personnel préposé à la lutte contre le feu: Porter un appareil de protection respiratoire autonome et des vêtements de protection.
Information supplémentaire: Refroidir les récipients/réservoirs par pulvérisation d'eau.
Minimiser l'exposition.
Ne pas respirer les fumées.
Endiguer l'écoulement.

6. MESURES À PRENDRE EN CAS DE DISPERSION ACCIDENTELLE

Précautions individuelles
Durant le nettoyage des déversements et la désactivation de cette matière, porter un appareil de protection respiratoire (avec cartouche de protection contre les vapeurs organiques et les gaz acides et un filtre anti-poussières/ brouillard) approuvé par NIOSH (ou un équivalent).
CE PRODUIT EST CORROSIF. Pour le nettoyage des déversements et la désactivation de ce produit, porter des vêtements de protection: lunettes anti-éclaboussures, gants pleine longueur en caoutchouc nitrile ou butyle, tablier en caoutchouc, ou des vêtements en caoutchouc nitrile ou butyle, et des protège-chaussures en caoutchouc. Si ce produit entre en contact avec la peau pendant les phases de nettoyage, enlever IMMEDIATEMENT tous les vêtements contaminés et laver la peau exposée avec du savon et de l'eau. Voir la SECTION 4, Premiers secours, pour plus de renseignements.
Méthodes de nettoyage
ATTENTION: Ne pas rejeter dans les égouts ou dans l'environnement. Absorber les rejets accidentels au moyen de matériaux absorbants solides du type vermiculite ou autres et collecter les produits usagés dans des récipients appropriés en vue d'une élimination ultérieure. Désactiver l'aire exposée au moyen d'une solution à 5% de bicarbonate de soude et de 5% d'hypochlorite de sodium dans l'eau. Utiliser cette solution de décontamination à raison de 10 volumes de solution par volume de rejet. Laisser agir 30 minutes. Laver l'aire contaminée à grande eau et collecter les effluents pour traitement selon la législation en vigueur. Ne pas traiter l'absorbant usagé avec la solution de désactivation mais se repporter à la section 13 pour informations sur l'élimination.

7. MANIPULATION ET STOCKAGE

Manipulation
Ce produit est corrosif. Équipement de protection individuel, voir section 8. Ne pas manipuler près de nourriture ou d'eau potable.

Stockage
Conditions de stockage: Conserver dans un endroit bien ventilé. Entreposer dans un endroit frais et ombragé. Ne pas stocker ce produit dans des conteneurs en: acier Ne pas stocker près de nourriture ou d'eau potable. Conserver le récipient bien fermé.
Information supplémentaire sur les conditions de stockage: LES RECIPIENTS VIDES PEUVENT ÊTRE DANGEREUX. Ilscontiennent des résidus du produit. Suivre les indications portées sur les FICHES DE DONNEES DE SECURITE et les étiquettes même si les récipients sont vides. Date d'expiration basée sur la conservation de plus de 95% de matières actives dans des conditions de température de stockage comprises entre 20 et 25℃ (68ºF-77ºF).
Température de stockage: >= 1 ℃ (>= 34 ℉)
Température de stockage: <= 37 ℃ (<= 99 ℉)

8. CONTRÔLES DE L'EXPOSITION/PROTECTION INDIVIDUELLE

Limite(s) d'exposition
Les limites d'exposition sont énumérées ci-dessous , si existantes .

Composant	Réglementation	Type de liste	Valeur

2-octyl-2H-isothiazole-3-one	Rohm and Haas	TWA	0.2 mg/m3
	Rohm and Haas	VLE	0.6 mg/m3

Composant	Réglementation	Type de liste	Valeur
Propylène glycol	Rohm and Haas	TWA	175 ppm
		TWA Aérosol	10 mg/m3

Protection des yeux: Porter des lunettes de protection à coquilles fermées et écran facial (ANSI Z87.1 ou équivalent) Porter des lunettes de protection compatibles avec les appareils respiratoires utilisés.
Protection des mains: Pour chaque manipulation, mettre des gants résistants aux produits chimiques. Le type de gants recommandés est indiqué ci-dessous. caoutchouc butyle Caoutchouc nitrile En cas de dégradation ou de pénétration d'agents chimiques, retirer et changer immédiatement les gants de protection. Rincer et retirer immédiatement les gants après usage. Se savonner et se rincer les mains. NOTE : Le produit peut être un sensibilisant par contact avec la peau.
Protection de la peau et du corps: Porter selon besoins: Tablier résistant aux produits chimiques combinaison complète de protection contre les agents chimiques
Protection respiratoire: L'emploi typique de cette matière n'entraîne pas, en milieu de travail, des expositions qui dépassent les limites d'exposition mentionnées dans la Section « Renseignements sur les limites d'exposition ». Dans les rares situations où les limites d'expostion mentionnées sont dépassées; il faut adopter un programme de protection respiratoire conforme aux exigences des normes 1910.134 de l'OSAH et Z88.2 de l'ANSI. Pour les concentrations allant jusqu'à 10 fois la limite d'exposition stipulée, il faut porter un respirateur à demi-masque ou un respirateur à adduction d'air à masque complet équipé de cartouches de protection contre les vapeurs organiques et de filtres N95, approuvé par NIOSH (ou l'équivalent), correctement ajusté. En présence d'une bruine d'huille, on doit utiliser des filtres R95 ou P95. Pour les très rares situations où l'exposition pourrait dépasser considérablement les limites d'exposition mentionnées (c'est-à-dire plus que 10 fois plus grande), ou dans n'importe quel cas d'urgence, il faut porter un appareil respiratoire autonome au mode de demande par pression ou un respirateur à adduction d'air pur à masque complet au mode de demande par pression, approuvé par NIOSH (ou l'équivalent), correctement ajusté, avec dispositif d'évacuation d'urgence. Voir la SECTION 6, Mesures à prendre en cas de fuite accidentelle, pour connaître les exigences quant au respirateur ou aux vêtements de protection pour le nettoyage des déversements et la décontamination de cette matière.
Mesures de protection: Les installations de stockage ou d'utilisation de ce produit doivent être équipées d'un rince-oeil et d'une douche de premiers secours.
Mesures d'ordre technique: Utiliser une ventilation aspirante ayant une vélocité de capture minimale de 150 pieds/minute (0.75 m/sec.) au point de dégagement de la poussière ou du brouillard. Pour plus de renseignements concernant la conception, l'installation, l'emploi et l'entretien des systèmes de ventilation, consulter l'édition courante du manuel intitulé « Industrial Ventilation: A Manual of Recommended Practice » publié par l'American Conference of Governmental Industrial Hygienists.

9. PROPRIÉTÉS PHYSIQUES ET CHIMIQUES

Aspect	
Forme	liquide
Couleur	Jaune pâle clair
Odeur	Odeur agréable
pH	2.4 (Solution à 10%)
Point/intervalle d'ébullition	188 °C (370.40 °F)
Point/intervalle de fusion	-48.00 °C (-54.40 °F)
Point d'éclair	107 °C (224.60 °F)
Température d'inflammation	371 °C (699.80 °F) Propylène glycol
Limite d'explosivité, inférieure	2.60 % (v)Propylène glycol

Limite d'explosivité, supérieure	12.50 % (v)Propylène glycol
Pression de vapeur	0.1 mmHg à 25 ℃ (77.00 ℉) Propylène glycol
Densité de vapeur relative	>1.0
Hydrosolubilité	Très soluble
Coefficient de partage: n-octanol/eau	log Pow: 2.45 Calculé
Densité relative	1.03 à 20.00 ℃ (68.00 ℉) évalué
Viscosité, dynamique	40.000 mPa.s à 20.00 ℃ (68.00 ℉)
Taux d'évaporation	<1.00
Pourcentage de produits volatils	95 %

N.B.: Les données physiques présentées ci-dessus sont des valeurs typiques et ne doivent pas être interprétées comme des spécifications.

10. STABILITÉ ET RÉACTIVITÉ

Réactions dangereuses	Stable dans les conditions recommandées de stockage.
Matières à éviter	Eviter le contact avec les produits suivants : Oxydants Amines Agents réducteurs mercaptans
Produits de décomposition dangereux	oxydes d'azote (NOx), Oxydes de soufre, Chlorure d'hydrogène,
polymérisation	Le produit ne peut pas polymériser

11. INFORMATIONS TOXICOLOGIQUES

Toxicité aiguë par voie orale	DL50 rat femelle >5,000 mg/kg
Toxicité aiguë par inhalation	CL50 rat 4 h >1.95 mg/l
Toxicité aiguë par voie cutanée	DL50 lapin >2,000 mg/kg
Irritation de la peau	lapin Corrosif
Irritation des yeux	lapin Corrosif
Sensibilisation	cochon d'Inde A un effet sensibilisant.

Cancérogénicité:
N'a pas montré d'effets cancérigènes lors des expérimentations animales.
Cancérogénicité:
Matière active
Tératogénicité
N'a pas montré d'effets tératogènes lors des expérimentations animales.
Tératogénicité
Matière active
Mutagénicité

Non-mutagène
Mutagénicité
Matière active

12. INFORMATIONS ÉCOLOGIQUES

Informations pour l'élimination (persistance et dégradabilité)

Elimination physico-chimique	Inhibition de boues activées EC50: 47 mg/l ai
Effets écotoxicologiques	
Toxicité pour le poisson	CL50 Oncorhynchus mykiss (Truite arc-en-ciel) 96 h OCDE Ligne directrice 203 0.047 mg/l Matière active
Toxicité pour le poisson	CL50 Lepomis macrochirus (Crapet arlequin) 96 h OCDE Ligne directrice 203 0.18 mg/l Matière active
Toxicité pour les algues	CE50 Algues (selenastrum capricornutum) 72 h OCDE Ligne directrice 201 0.031 mg/l Matière active
Toxicité pour les organismes invertébrés aquatiques.	CE50 Daphnies 48 h FIFRA 77-2 0.32 mg/l Matière active

13. CONSIDÉRATIONS RELATIVES À L'ÉLIMINATION

Élimination

Classifiction des déchets: Si ce produit doit être mis en décharge il faut savoir qu'il ne satisfait pas aux caractéristiques RCRA's et n'est pas sur la liste 40 CFR 261.33
Incinérer le liquide et les solides contaminés,suivant la réglementation en vigueur . .

14. INFORMATIONS RELATIVES AU TRANSPORT

DOT/TDG

Nom d'expédition des Nations unies	Corrosive liquid, acidic, organic, n.o.s.(2-octyl-2H-isothiazole-3-one)
Numéro ONU	UN 3265
Classe	8
Groupe d'emballage	II

IMO/IMDG

Nom d'expédition des Nations unies	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(2-octyl-2H-isothiazole-3-one)
Numéro ONU	UN 3265
Classe	8
Groupe d'emballage	II
Polluant marin	2-octyl-2H-isothiazole-3-one

Les classifications transport peuvent varier en fonction du volume de l'emballage et peuvent être influencées par des variations règlementaires régionales ou nationales.

15. INFORMATIONS RÉGLEMENTAIRES

Classification communautaire

OSHA:	Ce produit est considéré dangereux en vertu de la norme sur la communication de renseignements à l'égard des matières dangeureuses de l'OSHA (29CFR 1910.1200).
SIMDUT:	Ce produit est réglementé par la Loi sur les produits antiparasitaires (P.C.P. Act). Par conséquent, il est exempt de l'étiquetage du fournisseur et de la fiche de données de sécurité comme spécifié dans la Section 12 du Loi sur les produits dangereux.

Classification SIMDUT

Ce produit a été classifié conformément aux critères de risque du Règlement sur les Produits Contrôlés (RPC) et la Fiche de Données Sécurité contient tous les renseignements exigés par le RPC.

Canada. Loi sur la protection de l'environnement. (LIS): Tous les composants sont conformes à l'inventaire des 'réglementations s'appliquant aux substances nouvelles'

US. Toxic Substances Control Act (TSCA): Ce produit est soumis à la réglementation de la loi américaine « Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) » et, par conséquent, il est exempt des exigences d'homologation de la loi américaine Toxic Substance Control Act (TSCA)

16. AUTRES INFORMATIONS

HMIS Classe de Danger

Santé	Feu	Réactivité	Danger Physique	PPE
3	0	0		

Légende

ACGIH	American Conference of Governmental Industrial Hygienists
BAc	Acétate de butyle
OSHA	Occupational Safety and Health Administration
PEL	Limite d'exposition admissible
VLE	Valeur limite d'exposition à court terme
TLV	Valeur limite tolérable
TWA	Valeur limite de moyenne d'exposition
|	La barre dénote une révision de fiche de données de sécurité antérieure.

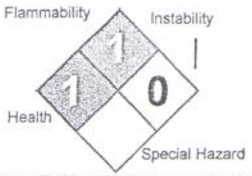
Les informations contenues dans la présente fiche de sécurité ont été établies sur la base de nos connaissances à la date de publication de ce document. Ces informations ne sont données qu'à titre indicatif en vue de permettre des opérations de manipulation, fabrication, stockage, transport, distribution, mise à disposition, utilisation et élimination dans des conditions satisfaisantes de sécurité, et ne sauraient donc être interprétées comme une garantie ou considérées comme des spécifications de qualité. Ces informations ne concernent en outre que le produit nommément désigné et, sauf indication contraire spécifique, peuvent ne pas être applicables en cas de mélange dudit produit avec d'autres substances ou utilisables pour tout procédé de fabrication.

Version: 2.1
Date d'impression: 05/01/2012

Layout 000101080174

MATERIAL SAFETY DATA SHEET
Pinnacle Liquid Fabric Softener

HEALTH ☐	1
FLAMMABILITY	1
[illegible]	0
PPE	B



Printed: 06/15/2011
Revision: 10/12/2010

1. Product and Company Identification

Product Name:	Pinnacle Liquid Fabric Softener	
Manufacturer Information		
Company Name:	Washing Systems LLC 5579 Spellmire Drive Cincinnati, OH 45246	
Phone Number:	(513)870-4830	
Emergency Contact:	Chemtrec	(800)424-9300
Preparer Name:	Washing Systems LLC	(513)870-4546
Intended Use:	Softener	
Part Number:	PSO040 PSO120 PSO240 PSO440 PSOTT	

2. Hazards Identification

Emergency Overview: Caution! May cause eye, skin, and respiratory tract irritation. May cause digestive tract irritation.

Target Organs: Eyes, skin, respiratory tract, digestive tract.

Potential Health Effects (Acute and Chronic): Eye: May cause eye irritation.

Skin Contact: Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation dermatitis.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage.

Inhalation: Inhalation of vapors may cause drowsiness and dizziness. Material may be irritating to mucous membranes and upper respiratory tract.

Chronic: Prolonged exposure may cause skin irritation.

LD 50 / LC 50: Refer to Section 11.

Signs and Symptoms Of Exposure: Symptoms of exposure may include burning sensation, coughing, wheezing, shortness of breath, headache, nausea, and vomiting.

Medical Conditions Generally Aggravated By Exposure: None known.

3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration
1. Isopropyl alcohol {sec-Propyl alcohol; IPA; 2-Propanol}	67-63-0	1.0 -5.0 %
2. Methyl tallow diethylenetriamine condensate, polyethoxylated, metyl sulfate	68410-69-5	15.0 -30.0 %

4. First Aid Measures

Emergency and First Aid Procedures:	Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid. Skin: Wash with soap and water. Get medical aid if irritation develops and persists. Ingestion: If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Give large amounts of water. Get medical aid. Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately.

5. Fire Fighting Measures

Flash Pt:	> 200 F (93.3 C)
Explosive Limits:	LEL: N.D. UEL: N.D.
Autoignition Pt:	N.D.
Fire Fighting Instructions:	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water or foam may cause frothing which can be violent especially if sprayed into containers of hot, burning liquid.
Flammable Properties and Hazards:	Not flammable by WHMIS/OSHA criteria. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
Hazardous Combustion Products:	Oxides of carbon. Nitrogen oxides. Sulfur dioxide.
Suitable Extinguishing Media:	Dry chemical, water fog, alcohol foam.
Unsuitable Extinguishing Media:	None known.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Keep unauthorized personnel away. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Provide ventilation. SMALL SPILLS: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. LARGE SPILLS: Contact emergency responder for advice.

7. Handling and Storage

Precautions To Be Taken in Handling:	Keep container tightly closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. Take precautionary measures against static discharges. Wash thoroughly after handling. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Avoid breathing dust, mist, or vapor. Avoid prolonged or repeated exposure.
Precautions To Be Taken in Storing:	Store in a cool, dry, well-ventilated area away from incompatible substances. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous.

8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TWA	Other Limits
1. Isopropyl alcohol {sec-Propyl alcohol; IPA; 2-Propanol}	67-63-0	PEL: 400 ppm	TLV: 200 ppm STEL: 400 ppm	400 ppm (ACGIH STEL)
2. Methyl tallow diethylenetriamine condensate, polyethoxylated, metyl sulfate	68410-69-5	No data.	No data.	No data.

Respiratory Equipment (Specify Type):	Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Eye Protection:	Goggles.
Protective Gloves:	Wear appropriate gloves to prevent skin exposure.
Other Protective Clothing:	Wear appropriate protective clothing to prevent skin exposure.
Engineering Controls (Ventilation etc.):	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Work/Hygienic/Maintenance Practices:	General industrial hygiene practice. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States:	[ ] Gas [X] Liquid [ ] Solid
Melting Point:	NA
Boiling Point:	NP
Decomposition Temperature:	NA
Autoignition Pt:	N.D.
Flash Pt:	> 200 F (93.3 C)
Specific Gravity (Water = 1):	1.01
Density:	63.02 LB/CF
Vapor Pressure (vs. Air or mm Hg):	NP
Vapor Density (vs. Air = 1):	NP
Evaporation Rate:	NP
Solubility in Water:	Dispersible
Percent Volatile:	NA
Viscosity:	50 - 1000 cP
Octanol/Water Partition Coefficient:	NA
pH:	6.73 (1%)
Appearance and Odor:	Appearance: White. Cream. Odor: alcohol-like. Odor Threshold: {NA}

10. Stability and Reactivity

Stability:	Unstable [ ] Stable [X]
Conditions To Avoid - Instability:	Excess heat. Ignition sources.
Incompatibility - Materials To Avoid:	Strong oxidizing agents.
Hazardous Decomposition Or Byproducts:	Carbon monoxide. Carbon dioxide. Nitrogen oxides. Sulfur dioxide.
Possibility of Hazardous Reactions:	Will occur [ ] Will not occur [X]

Conditions To Avoid - Hazardous Reactions: Product will not undergo polymerization.

11. Toxicological Information

Ingredient: CAS# 67-63-0. Isopropanol:
Oral, rat: LC50=12,000 ppm (8-hr exposure); Oral, rat: LD50=6 ml/kg; Dermal, rabbit: LD50=16.4 ml/kg.

Chronic Toxicological Effects:
Mutagenicity: Non-hazardous by WHMIS criteria.
Reproductive Effects: Non-hazardous by WHMIS criteria.
Sensitization: Non-hazardous by WHMIS criteria.
Teratogenicity: Non-hazardous by WHMIS criteria.

Carcinogenicity/Other Information: A4 and IARC 3: Not classifiable as a human carcinogen.

Hazardous Components (Chemical Name)	CAS #	NTP	IARC	ACGIH	OSHA
1. Isopropyl alcohol {sec-Propyl alcohol; IPA; 2-Propanol}	67-63-0	No	3	A4	No
2. Methyl tallow diethylenetriamine condensate, polyethoxylated, metyl sulfate	68410-69-5	No	No	No	No

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

Components of this product have been identified as having potential environmental concerns.

13. Disposal Considerations

Waste Disposal Method: Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name Not regulated as a hazardous material.

LAND TRANSPORT (Canadian TDG)

Additional Transport Information: No data available.

15. Regulatory Information

Canadian WHMIS Classification

Class D Division 2, Subdivision B.

US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)
1. Isopropyl alcohol {sec-Propyl alcohol; IPA; 2-Propanol}	67-63-0	No	No	Yes
2. Methyl tallow diethylenetriamine condensate, polyethoxylated, metyl sulfate	68410-69-5	No	No	No

EPA Hazard Categories: This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard

[ ] Yes [X] No Chronic (delayed) Health Hazard

[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

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

16. Other Information

Company Policy or Disclaimer

Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Expiration Date: 15-June 2014.

N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required

MATERIAL SAFETY DATA SHEET
Manufactured by: **A.L. Wilson Chemical Company**
Product Name: **InkGo®**
Revision Number 1.0 Dated: 03/26/12

1. Chemical Product and Company Identification

Product name: InkGo®
Product Description: Odor Free Formula Ink Remover for use by Professional Dry Cleaners and Launderers
Manufacturer:
A.L. Wilson Chemical Company
P.O. Box 207
Kearny, NJ 07032 U.S.A.
Telephone No. 800-526-1188 or 201-997-3300
Emergency No. CHEMTREC: 800-424-9300 or 703-527-3887

2. Composition / Information on ingredients

Chemical and Common Name	CAS#	Wt%	OSHA PEL	ACGIH TLV
2-(2 Butoxy Ethoxy) Ethyl Acetate	124-17-4		-	-
2-(2 Propoxyethoxy) Ethanol	6881-94-3		-	-
DPNB (Dipropylene glycol n-butylether)	29911-28-2		-	-
Distillate (Petroleum) Hydrotreated Light	64742-47-8		-	-
2-(2-Ethoxyethoxy) Ethyl Acetate	112-15-2		-	-

3. Hazard(s) identification

Emergency overview: Clear to light yellow liquid. Combustible. In case of fire; Carbon Dioxide, Carbon Monoxide.

Eye Contact: May cause serious eye irritation.
Skin Contact: May cause skin irritation. Prolonged or repeated contact may dry or defat skin.
Inhalation: Overexposure may cause irritation or dryness of nose, throat.
Ingestion: Coughing and vomiting may occur.
Chronic hazards:
Physical hazards: Spilled material could be slippery.

HMIS RATINGS	
HEALTH	1
FLAMMABILITY	1
PHYSICAL HAZARD	0
PERSONAL PROTECTION	

Hazard Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe

HMIS® III: The HMIS® III ratings displayed on the front of this MSDS are from the HMIS® Third Edition. There have been significant changes made to the system.
“PH” stands for “Physical Hazard” as defined in the OSHA Haz Com Standard and replaces the former code “R” for “Reactivity”.

4. First Aid Measures

Eye contact:

If in eyes, immediately flush with running water for at least 15 minutes. Get emergency medical attention.

Skin contact:

If on skin, flush immediately with water for at least 15 minutes. Wash contact area with soap and water. Remove contaminated clothing, wash before re-use. If irritation occurs, get medical attention.

Inhalation:

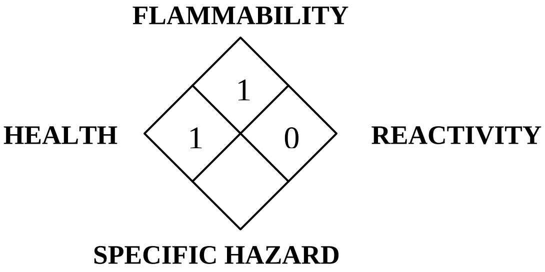
If inhaled, move affected person to fresh air. If drowsiness or dizziness persists; get emergency medical attention.

Ingestion:

If swallowed, get emergency medical attention (Never give anything by mouth to an unconscious person.). Do not induce vomiting.

5. Firefighting Measures

NFPA RATINGS



Hazard Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe

Fire Fighters should use NIOSH approved SCBA & full protective equipment when fighting chemical fire. Use water spray to cool nearby containers exposed to fire.
Suitable extinguishing media: Use water fog, foam, carbon dioxide (CO2) to extinguish flames.

Unsuitable extinguishing media: ND

Specific hazards in case of fire: Carbon Dioxide, Carbon Monoxide

6. Accidental Release Measures

Extinguish all ignition sources.

Personal precautions:

Cordon off spilled area. Wear protective clothing, neoprene or rubber chemical resistance gloves, rubber apron, rubber boots and chemical splash goggles. Remove any contaminated clothing and wash before re-use. Wash thoroughly after handling.

Do not flush into storm sewer or contaminate ground water.

Dispose in accordance with local regulations.

Methods and materials for containment and cleaning up:

Use a universal absorbent material or use vermiculite to collect waste and dispose in accordance with local regulations.

7. Handling and storage

Handing: Keep away from sparks, heat and flame sources.

Storage: Keep container sealed when not in use. Store in a cool and well ventilated place.

Do not store in a substitute container.

8. Exposure controls / personal protection

Information on the system design:

Name	Concentration	Air Concentration (8 Hour)
Distillate (Petroleum) Hydrotreated Light	-	Vapor, TWA = 1200 mg/m^3
DPNB (Dipropylene glycol n-butylether)	-	Aerosol, TWA = 10 mg/m^3

Engineering Controls:

Use in well-ventilated area with local exhaust.

General Information: Eye and skin washing facilities.

Respiratory protection:

None needed when used with adequate ventilation.

Eye protection:

Safety glasses with side shields or chemical goggles must be worn.

Do not wear contact lenses.

Skin protection:

Wear rubber or neoprene chemical resistant gloves. Wash thoroughly after handling.

Do not smoke, eat or drink in work area.

9. Physical and chemical properties

Physical state: Liquid
Colour: Clear to light yellow
Odour: Light solvent odor
pH-value: > 2.1 (10% solution in water)
Initial boiling point: ND
Flash point: > 180°F
Relative density: 0.96 at 20°C
Solubility: Low in water at 20°C

10. Stability and reactivity

Chemical stability: Stable, if used according to specifications.
Possibility of hazardous reactions: Strong Alkali, oxidizing and reducing agents
Conditions to avoid: Strong Alkali, Flames.
Materials to avoid: Strong alkali, oxidizing and reducing agent
Hazardous decomposition products: In case of fire; Carbon Dioxide, Carbon Monoxide

11. Toxicological information

Acute Toxicity:

Acute Toxicity:		
T	**R**	**B**
Oral LD_{50}	Not available	
Dermal LD_{50}	Not available	
Inhalation LD_{50}	Not available	
Eye Irritation	May Cause serious eye irritation	Based on Ingredients

Chronic Toxicity:

Test	**Results**
Dermal Sensitization	Not Available
Carcinogenicity	Not Listed IARC, NTP, OSHA

12. Ecological information

Aquatic Toxicity: ND

13. Disposal considerations

Waste Disposal:

Dispose of in accordance with federal, state and local regulations.

14. Transport information

This material is non-hazardous for shipping.

15. Regulatory information

All components are on TSCA (U.S.A), EINECS (EUROPE), AICS (Australia), ENCS (Japan), ECL (Korea), and DSL (Canada).

U.S. Regulations:

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:

SARA (311/312) HAZARD CATEGORIES: Fire

SARA 313: This product contains the following SARA 313 Toxic Release Chemicals.

Chemical Name	CAS Number	Concentration
2-(2 Butoxy Ethoxy) Ethyl Acetate*	124-17-4	
2-(2 Propoxyethoxy) Ethanol*	6881-94-3	
2-(2-Butoxyethoxy)Ethyl Acetate*	112-15-2	
*Subject to SARA, Title III Section 313 and 40 CFR 372 – (Glycol Ethers)		

The following product components are cited on the lists below:

Chemical Name	CAS Number	List Citations
2-(2-Butoxyethoxy)Ethyl Acetate	112-15-2	WHMIS[1]
2-(2 Propoxyethoxy) Ethanol	6881-94-3	WHMIS[2]

[1] Uncontrolled product according to WHMIS classification criteria.
[2] Classified under Controlled Product Regulations by supplier as: Controlled, D/2/B (WHMIS). This product is not in the HPA list.

16. Other information

Abbreviations and acronyms:
ACGIH = American Conference of Governmental Industrial Hygienists
AICS = Australian Inventory of Chemical Substances
CFR = Code of Federal Regulations
DOT = Department of Transportation
DSL = Domestic Substance List (Canada)
ECL = Existing Chemicals List
EINECS = European Inventory of New and Existing Chemicals
ENCS = Inventory of Existing and New Chemicals Substances
HMIS = Hazardous Materials Identification System
HPA = Hazardous Product Act (Canada)
IATA = International Air Transportation Association
IMDG = International Maritime Dangerous Goods
ND = Not Determined
NFPA = National Fire Protection Association
NIOSH = National Institute for Occupational Safety and Health
OSHA = Occupational Safety & Health Administration
PEL = Permissible Exposure Limits
SARA = Superfund Amendments and Reauthorization Act of 1986
SCBA = Self Contained Breathing Apparatus
STEL = Short Term Exposure Limits
TDG = Transportation of Dangerous Goods (Canada)
TLV = Threshold Limit Values
TSCA = Toxic Substance Control Act
TWA = Time-Weighted Average
WHMIS = Workplace Hazardous Material Information System (Canada)

The information contained herein is accurate to the best of our knowledge. A.L. Wilson Chemical Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

New Form: Revision 1.0

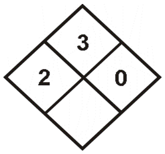
MATERIAL SAFETY DATA SHEET

PRODUCT KNOCK OUT

NFPA HAZARD RATINGS*

Adco™

Health	2	Moderate health hazard
Fire	3	Highly flammable
Stability	0	Stable



SECTION 1: PRODUCT INFORMATION

Manufacturer: ADCO Cleaning Products LLC, 900 W. Main, Sedalia, MO 65301 (660) 826-3300
EMERGENCY TELEPHONE NUMBERS: CHEMTREC (800) 424-9300 24 HRS 7 DAYS A WEEK; ADCO (800) 821-7556 (8-5 M-F)
Intended Product Use: Spot and stain remover for use in drycleaning only.
Synonyms: "Ink Remover"

SECTION 2: HAZARDOUS INGREDIENTS

Chemical Name	%	CAS #	OSHA PEL	LD 50
Aromatic hydrocarbons	<30	64742-95-6	100 ppm TWA	oral: 4.7 g/kg (rat) dermal: 3.48 g/kg (rat)
Isopropyl alcohol	10-30	67-63-0	400 ppm TWA	oral: 5.8 g/kg (rat) dermal: 13 g/kg (rabbit)

SECTION 3: PHYSICAL DATA

Appearance:	Clear, light-yellow liquid	Boiling Point:	245°F
Odor:	Sweet etheral	Solubility in Water:	Slight, forms emulsion
Specific Gravity (20° C):	0.91	Vapor Pressure (mm Hg):	No data
pH (20:80 in IPA/H_2O Soln.):	4.5-5.5	Vapor Density:	Heavier than air

SECTION 4: FIRE AND EXPLOSION HAZARD DATA

Upper Flammable Limit: No data
Flash Point (Method)(°F): 93 (TCC)
Lower Flammable Limit: No data
Extinguishing Media: Compatible with all types.
Special Fire Fighting Procedures: Wear self-contained breathing apparatus. Cool fire containers with water spray to keep from bursting.

Unusual Fire and Explosion Hazards: Vapors may travel along floor and form combustible or explosive mixture with air. Combustion products may be toxic.

SECTION 5: REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Use or storage at temperature above 110°F (48.8°C)

Incompatibility (materials to avoid): Strong oxidiers
Hazardous Decomposition Products: Burning may produce toxic vapors.
Hazardous Polymerization: Will not occur.

SECTION 6: HEALTH HAZARD DATA

Toxicity (Estimated): Slight

Effects of Overexposure:
Acute: Exposure to high concentrations of vapors can cause headaches, nausea, dizziness or nose, throat, or eye irritation. Contact with eyes or prolonged, repeated contact with skin may cause drying or irritation.

Chronic: Orthodichlorobenzene is reported to cause liver and kidney damage with prolonged/repeated exposure.

Carcinogenicity: None of the ingredients of this mixture have been identified as a carcinogen or probable carcinogen by ACGIH, IARC, or OSHA.

*Hazard ratings and other information are based on latest available information from tests on product or ingredients of mixtures. The data and evaluations are accurate to the best of ADCO's knowledge. No guarantee or liability is expressed or implied.

EXPOSURE LIMITS	IRRITANCY OF PRODUCT	SENSITIZATION TO PRODUCT	CARCINOGENICITY
100 ppm TWA (aromatic hydrocarbons), 400 ppm TWA (isopropyl alcohol)	Slight eye and skin	None known	No components are listed by ACGIH, IARC, or OSHA
TERATOGENICITY	REPRODUCTIVE TOXICITY	MUTAGENICITY	SYNERGISTIC PRODUCTS
No effects reported	No effects reported	None reported	None reported

Based on known toxicity of components. No test data available on mixture.

SECTION 7: PREVENTATIVE MEASURES

SPECIAL PROTECTION INFORMATION

Respiratory Protection: None required when used as directed with adequate ventilation.
When cleaning up large spills in confined areas, self-contained breathing apparatus is recommended.

Ventilation: Normal industrial ventilation is adequate.

Protective Gloves: Ordinarily not needed. Use plastic or rubber gloves when contact is prolonged or frequent.
Eye Protection: Use goggles or face mask if splashing is likely.

Other protection equipment ordinarily not needed. Availability of eye washes and adequate ventilation in work areas recommended.

STORAGE AND HANDLING: Store in well ventilated area. Store in plastic or lined metal containers. Keep away from heat and open flames. Store away from stong oxidizers or active metals.

SPILL OR LEAK PROCEDURES: Avoid breathing vapors. Keep from sources of ignition. Soak up on absorbent material and transfer to resealable containers for disposal.

WASTE DISPOSAL METHOD: Liquid product on absorbents containing this product may be disposed of in manner that complies with all local, state and federal regulations for chlorinated hydrocarbons and highly flammable wastes.

RECOMMENDED PRECAUTIONARY LABELING:

CAUTION:

Contains toxic compounds. HIGHLY FLAMMABLE. Keep away from heat and open flames. Use with adequate ventilation. Avoid prolonged breathing of vapors. May cause dizziness or irritation to eyes, nose, and throat. Contact with eyes, prolonged or repeated contact with skin may cause drying or irritation. Harmful is swallowed.

FIRST AID:

Remove person overcome by vapors to fresh air. In case of contact with eyes, flush for 15 minutes with water. Wash off of skin with soap and water. If swallowed, do NOT induce vomiting.

KEEP OUT OF REACH OF CHILDREN. DO NOT TAKE INTERNALLY.

This product is intended for professional use only by trained personnel.

SECTION 8: FIRST AID

Inhalation: Remove person overcome by vapors to fresh air.
Eyes: Flush eyes for 15 minutes with water.
Skin: Wash off of skin with soap and water.

Ingestion: Do NOT induce vomiting.

IF SYMPTOMS PERSIST, SEEK MEDICAL ASSISTANCE

SECTION 9: SARA TITLE III

NOTE: This product does contain some components which are under the reporting requirements of SARA Title III, Section 313. If you are required to report discharges using Form R, SARA Title III, Section 313, information is available on amounts of reportable components.

SECTION 10: PREPARATION DATE

This information is provided for guidance only based on information we have compiled. No guarantee of accuracy or completeness is expressed or implied.

ADCO RESEARCH DEPARTMENT

Prepared by: Julie D. Hirner
Julie D. Hirner

Date: April 16, 2010

Replaces MSDS of: November 10, 2008

MATERIAL SAFETY DATA SHEET

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: OXALIC ACID

PRODUCT USE: Special Detergent

MANUFACTURER: **TEXTILE CARE – DIVISION OF ECOLAB CO.**
5105 TOMKEN ROAD
MISSISSAUGA, ON L4W 2X5

SUPPLIER: **PRAIRIE DISTRIBUTORS CENTRAL INC.**
635 – 56TH STREET EAST
SASKATOON, SK S7K 7H7

EMERGENCY PHONE: 1-800-328-0026

SECTION 2: COMPOSITION, INFORMATION ON INGREDIENTS

Name	**CAS Number**	**% by weight**
ethanedioic acid, dihydrate	6153-56-6	60 – 100

SECTION 3: HAZARDS IDENTIFICATION

PHYSICAL STATE: Solid. [Powder.]

EMERGENCY OVER VIEW: DANGER! CAUSES DIGESTIVE TRACT, EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT IRRITATION. MAY BE FATAL IF SWALLOWED. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. Do not ingest. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

ROUTES OF ENTRY: Skin contact, eye contact, ingestion.

POTENTIAL ACUTE HEALTH EFFECTS:

EYES: Corrosive to eyes.

SKIN: Corrosive to the skin. May be harmful if absorbed through skin.

INHALATION: Severely irritating to the respiratory system.

INGESTION: May be fatal if swallowed. Causes burns to mouth, throat and stomach.

See toxicological information (Section 11).

SECTION 4: FIRST AID MEASURES

EYE CONTACT: In case of contact, immediately flush eyes with cool running water. Remove contact lenses and continue flushing with plenty of water for at least 15 minutes. Get medical attention immediately.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Apply calcium gluconate gel, if available, or milk of magnesia to affected area. Get medical attention immediately. Wash clothing before reuse. Clean shoes thoroughly before reuse.

INHALATION: If inhaled, remove to fresh air. If exposed person is not breathing, give artificial respiration or oxygen applied by trained personnel. Get medical attention immediately.

INGESTION: If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting. Never give anything by mouth to an unconscious person. If available, take several calcium antacid tablets (eg tums) or several tablespoons of milk of magnesia. Get medical attention immediately.

SECTION 5: FIRE FIGHTING MEASURES

AUTO IGNITION TEMPERATURE: Not available

FLASH POINT: > 100°C
Product does not support combustion.

FLAMMABLE LIMITS: Not available.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS: Decomposition products may include the following material: carbon dioxide and carbon monoxide.

FIRE FIGHTING MEDIA AND INSTRUCTIONS: Use an extinguishing agent suitable for surrounding fire. Dyke area of fire to prevent runoff. No specific fire or explosion hazard.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full-face piece operated in positive pressure mode.

Risk of explosion of the product in the presence of mechanical impact: Not available.

Risk of explosion of the product in the presence of static discharge: Not available.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Immediately contact emergency personnel. Stop leak if without risk. Use suitable protective equipment. Keep unnecessary personnel away. Do not touch or walk through spilt material.

ENVIRONMENTAL PRECAUTIONS: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

METHODS FOR CLEANING UP: If emergency personnel are unavailable, vacuum or carefully scoop up spilt material and place in an appropriate container for disposal. Avoid creating dusty conditions and prevent wind dispersal.

SECTION 7: HANDLING AND STORAGE

HANDLING: Do not ingest. Do not get in eyes, on skin or on clothing. Do not breathe dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

STORAGE: Keep out of reach of children. Keep container in a cool, well-ventilated area. Keep container tightly closed. Do not store above the following temperature: 50°C.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

PERSONAL PROTECTION:

EYES: Use chemical splash goggles. For continued or severe exposure wear a face shield over the goggles.

HANDS: Use chemical resistant, impervious gloves.

SKIN: Use synthetic apron, other protective equipment as necessary to prevent skin contact.

RESPIRATORY: Wear appropriate respirator when ventilation is inadequate and occupational exposure limits are exceeded.

Name	Exposure limits
ethanedioic acid, dihydrate	ACGIH TLV (United States, 1/2007) STEL: 2 mg/m^3 15 minute(s). TWA: 1 mg/m^3 8 hour(s).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Solid. [Powder.]

COLOUR: White.

ODOR: Faint odor.

PH: 1.1 to 2.1 [Conc. (% w/w): 1%]

BOILING/CONDENSATION POINT: >100°C (>212°F)

MELTING/FREEZING POINT: Not available

VAPOUR PRESSURE: Not available

VAPOUR DENSITY: Not available

ODOUR THRESHOLD: Not available

EVAPORATION RATE: Not available

LOGK_{OW}: Not available

DISPERSIBILITY PROPERTIES: Partially dispersible in the following materials: cold water and hot water.

SOLUBILITY: Partially soluble in the following materials: cold water and hot water.

SECTION 10: STABILITY AND REACTIVITY

STABILITY: The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

CONDITIONS OF INSTABILITY: Not available.

REACTIVITY: Highly reactive or incompatible with the following materials: alkalis. Reactive or incompatible with the following materials: metals. Slightly reactive or incompatible with the following materials: moisture.

HAZARDOUS DECOMPOSITION PRODUCTS: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

HAZARDOUS POLYMERISATION: Under normal conditions of storage and use, hazardous polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

POTENTIAL ACUTE HEALTH EFFECTS:

EYES: Corrosive to eyes.

SKIN: Corrosive to the skin. May be harmful if absorbed through skin.

INHALATION: Severely irritating to the respiratory system.

INGESTION: May be fatal if swallowed. Causes burns to mouth, throat and stomach.

POTENTIAL CHRONIC HEALTH EFFECTS:

CARCINOGENIC EFFECTS: No known significant effects or critical hazards.

MUTAGENIC EFFECTS: No known significant effects or critical hazards.

TERATOGENIC EFFECTS: No known significant effects or critical hazards.

REPRODUCTIVE EFFECTS: No known significant effects or critical hazards.

SENSITIZATION TO PRODUCT: No known significant effects or critical hazards.

SYNERGISTIC PRODUCTS: Not available
(toxicologically)

Toxicity data
Not applicable.

TARGET ORGANS: Contains material which causes damage to the following organs: kidneys, the nervous system, mucous membranes, heart, gastrointestinal tract, upper respiratory tract, central nervous system (CNS), nose/sinuses, throat.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Ingredient Name	Species	Period
Not available		

SECTION 13: DISPOSAL CONSIDERATIONS

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

SECTION 14: TRANSPORT INFORMATION

Certain shipping modes or package sizes may have exceptions from the transport regulations. The classification provided may not reflect those exceptions and may not apply to all shipping modes or package sizes.

Regulatory Information	UN Number	Proper Shipping Name	Class	Packing Group
TDG Classification	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S., (Oxalic acid diyhydrate)	8	II

See shipping documents for specific transportation information.

SECTION 15: REGULATORY INFORMATION

WHMIS: Class D-1A: Material causing immediate and serious toxic effects (Very Toxic).
Class E: Corrosive material.

Canada Inventory: All components are listed or exempted.

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

SECTION 16: OTHER INFORMATION

Date of issue: 09 – October – 2009

Responsible name: Regulatory Affairs

Date of previous issue: 21 – April - 2008

Revised Date: December 31, 2011

The above information is believed to be correct with respect to the formula used to manufacture the product in the country of origin. As data, standards, and regulations change, and conditions of use and handling are beyond our control, no warranty, express or implied, is made as to the completeness or continuing accuracy of this information.

Material Safety Data Sheet

LA1922
Oxalic acid

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA1922
Product Name: Oxalic acid
Synonyms: Ethanedionic acid.
Chemical Family: Saturated aliphatic carboxylic acid / saturated aliphatic dicarboxylic acid / alkanedioic acid
Application: Textile cleaning, flameproofing, rust removal, and fabric dyeing; metal and equipment cleaning; anti-corrosion coating; chemical intermediate and catalyst

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

Prepared By: The Safety, Health and Environment Department of Univar Canada Ltd.
Preparation date of MSDS: 02 June 2011
Telephone number of preparer: 1-866-686-4827

24-Hour Emergency Telephone Number (CANUTEC): (613) 996-6666

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percentage (W/W)	LD50s and LC50s Route & Species:
Oxalic Acid 144-62-7	100	Oral LD50 (Rat) 7500 mg/kg Oral LD50 (Rat) 475 mg/kg (male) calculated Oral LD50 (Rat) 375 mg/kg (female) calculated Dermal LD50 (Rabbit) 20000 mg/kg

Note: Other CAS# 6153-56-6.

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: Causes severe eye irritation. Can cause redness, pain and damage to the cornea. If damage is restricted to the outer layer of the eye, recovery may occur within a few days. Prolonged contact with solutions can produce irreversible eye damage.

3. HAZARDS IDENTIFICATION

Skin Contact: Solutions of 5 to 10 percent acid are irritating to the skin after prolonged exposure and can cause corrosive injury. Excessive contact may produce a delayed localized pain and discolouration of the skin with fingernails becoming brittle and blue-coloured.

Inhalation: May irritate mouth, nose, and throat. Coughing, chest pains, and breathing difficulty may occur. Headache, nausea and vomiting may occur.
Ingestion: Can cause severe poisoning or death, depending on the concentration and total amount of material ingested. Dilute solutions may cause no immediate irritation or pain, while concentrated material (such as 10% solutions or the solid) can cause burning pain in the mouth, throat and stomach, followed by profuse vomiting (sometimes bloody) (corrosive effects). Small doses of oxalate in the body may cause headache, pain and twitching in muscles and cramps. Larger doses can cause weak and irregular heartbeat, a drop in blood pressure and signs of heart failure. Large doses rapidly cause a shock-like state, convulsions, coma and possibly death. A delayed effect of ingestion is kidney damage, possibly leading to renal failure.

4. FIRST AID MEASURES

Eye Contact: Flush eyes with gently flowing water for at least 15 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse the contaminated water into the unaffected eye or face. Seek immediate medical attention. Seek immediate medical attention.
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.
Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. If symptoms persist, get medical attention. If the affected person is not breathing, apply artificial respiration. If breathing is difficult, give oxygen. In situations where administering oxygen is appropriate, first aiders must be trained in the safe use and handling of oxygen. It is preferable to administer oxygen under a doctor's supervision or advice. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately. Immediate medical assistance is required.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately.
Notes to Physician: If victim is conscious give immediately, by mouth, a fine suspension in water of a non-toxic calcium compound such as calcium lactate, chalk, plaster or milk. Large amounts of calcium are required to inactivate oxalate by precipitating it as the insoluble calcium oxalate salt.

5. FIRE FIGHTING MEASURES

Flash Point: None.
Flash Point Method: Not applicable.
Autoignition Temperature: Not available.
Flammable Limits in Air (%): Not Available.
Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Special Exposure Hazards: Use water spray to cool fire-exposed containers and structures.
Hazardous Decomposition/Combustion Materials (under fire conditions): Oxides of carbon.
Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.
NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 3, FLAMMABILITY 1, INSTABILITY 0
HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 3, FLAMMABILITY 1, REACTIVITY 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Consult local authorities.
Procedure for Clean Up: Ventilate area. Isolate hazard area and restrict access. Scoop up or vacuum up and place in an appropriate closed container. Flush area with water to remove trace residue.

7. HANDLING AND STORAGE

Handling: Avoid dust generation and provide for room ventilation during handling. Avoid breathing in dust. Avoid contact with eyes, skin and clothing. Keep away from heat, sparks and flame. Ensure all containers are labeled. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Wash thoroughly after handling.
Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Avoid storage with incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airbourne levels below recommended exposure limits.
Respiratory Protection: NIOSH RECOMMENDATIONS FOR OXALIC ACID CONCENTRATIONS IN AIR :
UP TO 25 mg/m^3: Powered air-purifying respirator with dust and mist filter(s); or SAR operated in a continuous-flow mode.
UP TO 50 mg/m^3: Full-facepiece respirator with high-efficiency particulate filter(s); or full-facepiece SCBA; or full-facepiece SAR.
UP TO 500 mg/m^3: Positive pressure, full-facepiece SAR.

Gloves:

Butyl rubber gloves. Neoprene gloves. Nitrile gloves. Polyvinylchloride (PVC) gloves.
Skin Protection: Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.
Eyes: Chemical goggles; also wear a face shield if splashing hazard exists.
Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Oxalic Acid	2 mg/m^3 STEL 1 mg/m^3 TLV-TWA	1 mg/m^3 TWA 2 mg/m^3 STEL	500 mg/m^3

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid Crystals or Powder.
Colour: Colourless Transparent.
Odour: Odourless
pH 1.3 (0.1 M solution in water)
Specific Gravity: Not Available.
Boiling Point: Not Available.
Freezing/Melting Point: Not Available.
Vapour Pressure: <0.001 mm Hg @ 20 deg C
Vapour Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: Not Available.
Solubility: Soluble in water.
VOCs: Not Available.
Viscosity: Not Available.
Molecular Weight: 90.04 (anhydrous) , 126.07 (dihydrate)
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable. If heated to melting point, sublimation and decomposition occurs.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Avoid excessive heat, open flames and all ignition sources. Moisture. Incompatible materials.
Materials to Avoid: Alkalis. Alkali metals. Oxidizing agents. Silver. Iron. Acid chlorides.
Hazardous Decomposition Products: Oxides of carbon.
Additional Information:

10. STABILITY AND REACTIVITY

No additional remark.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: Can cause severe poisoning or death, depending on the concentration and total amount of material ingested. Dilute solutions may cause no immediate irritation or pain, while concentrated material (such as 10% solutions or the solid) can cause burning pain in the mouth, throat and stomach, followed by profuse vomiting (sometimes bloody) (corrosive effects). Small doses of oxalate in the body may cause headache, pain and twitching in muscles and cramps. Larger doses can cause weak and irregular heartbeat, a drop in blood pressure and signs of heart failure. Large doses rapidly cause a shock-like state, convulsions, coma and possibly death. A delayed effect of ingestion is kidney damage, possibly leading to renal failure.

Skin Contact: Solutions of 5 to 10 percent acid are irritating to the skin after prolonged exposure and can cause corrosive injury. Excessive contact may produce a delayed localized pain and discolouration of the skin with fingernails becoming brittle and blue-coloured.

Inhalation: May irritate mouth, nose, and throat. Coughing, chest pains, and breathing difficulty may occur. Headache, nausea and vomiting may occur.
Eye Contact: Causes severe eye irritation. Can cause redness, pain and damage to the cornea. If damage is restricted to the outer layer of the eye, recovery may occur within a few days. Prolonged contact with solutions can produce irreversible eye damage.

Additional Information: Long term exposure to oxalic acid solutions, by ingestion, skin absorption and inhalation, is linked to stone formation (calculi) in the kidney and urinary tract (urolithiasis) of workers. Painful abdominal spasms (during the passing of the stone) as well as painful and difficult urination during exposure). Oxalic acid solutions can cause localized pain, discolouration of the fingers and nails and possibly ulcers and gangrene. Weight loss, chronic inflammation of the upper respiratory tract, irritation of the nose and throat and painful urination were symptoms of long term chronic exposure by inhalation.

Acute Test of Product:
Acute Oral LD50: Not Available.
Acute Dermal LD50: Not Available.
Acute Inhalation LC50: Not Available.

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Oxalic Acid	Not listed.	Not listed.

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: Not Available.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Oxalic Acid	LC50 24 h (Lepomis macrochirus) 4000 mg/L static	Not Available.	Not Available.

Other Information:
No additional remark.

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

DOT (U.S.):
DOT Shipping Name: Not Regulated.
DOT Hazardous Class Not Applicable.
DOT UN Number: Not Applicable.
DOT Packing Group: Not Applicable.
DOT Reportable Quantity (lbs): Not Available.
Note: No additional remark.
Marine Pollutant: No.

TDG (Canada):
TDG Shipping Name: Not Regulated.
Hazard Class: Not Applicable.
UN Number: Not Applicable.
Packing Group: Not Applicable.
Note: No additional remark.
Marine Pollutant: No.

15. REGULATORY INFORMATION

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

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

Note: Not available.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Oxalic Acid	Not Listed.	Not Listed.	Not Listed.

California Proposition 65: Not Listed.
MA Right to Know List: Listed.
New Jersey Right-to-Know List: Listed.
Pennsylvania Right to Know List: Listed.

WHMIS Hazardous Class:
D1B TOXIC MATERIALS
E CORROSIVE MATERIAL

16. OTHER INFORMATION

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

Disclaimer:

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

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

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

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

Brenntag Canada Inc. **BRENNTAG**

MATERIAL SAFETY DATA SHEET

SODIUM HYPOCHLORITE 1 15 8318 8378 8389 8555 8619

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#:	00060708
Index:	GCD0044/13A
Effective Date:	2013 January 24
Date of Revision:	2013 April 22

EMERGENCY TELEPHONE NUMBER F E I C S R

1 855 273 6824

PRODUCT IDENTIFICATION

Product Name:	Sodium Hypochlorite, 1 - 15 % (8318, 8378, 8389, 8555, 8619).
Chemical Name:	Hypochlorous acid, sodium salt.
Synonyms:	Sodium Hypo 1.5 %, 4 %, 5.4 % (6 % Trade), 6 %, 10.8 % (12 % Trade), 13.06 % (15 % Trade), 15.21 % (18 % Trade), 19 %; Superchlor; Sodium Hypo Basic 12; Sodium Hypo (Brite n White), (Sanitizer LT150), (Riverside Blend), (Riverside Blend #2); RM Weak Sodium Hypo Sol'n; Exolab XY-12 (58530); EC Sodium Hypo 12 % Atlantic, Lavo; Superchlor; Soda bleach liquor; Javel water; Sodium oxychloride; Clorox; Javex; Sodium Hypo High Alkalinity.
Chemical Family:	Aqueous mixture of Hypochlorous acid salt.
Molecular Formula:	NaOCl.
Product Use:	Industrial laundry bleach. Chemical intermediate. Laboratory reagent. Oxidizing agent. Bleaching agent. Water treatment. Fungicide.

WHMIS C S :

D-2B: Toxic (skin sensitizer)
E: Corrosive

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*
Sodium Hypochlorite	7681-52-9	---		1 - 15
Decomposition Product: Chlorine	7782-50-5	0.5 ppm	*A4	

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

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Corrosive! Toxic effects are principally related to its corrosive properties. May be fatal if swallowed. Causes severe skin and eye burns. Mists or sprays are extremely irritating to eyes and respiratory tract. May cause corneal damage and conjunctivitis. May cause skin sensitization or other allergic responses. 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:	Corrosive! Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. If mixed with acids or warmed to temperatures greater than 40 °C Sodium Hypochlorite solutions release Chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of Chlorine gas may result in severe lung damage. (4) See "Other Health Effects" Section.
Skin Contact:	Corrosive! Burns (chemical) can occur if not promptly removed. Concentrated solutions may cause pain and deep and severe burns to the skin. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin. Prolonged and repeated contact may lead to dermatitis. Toxic effects may be delayed. Avoid handling when the skin is moist, wet or abraded.
Skin Absorption:	Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin.
Eye Contact:	Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur.
Ingestion:	Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur.
Other Health Effects:	Corrosive effects 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. May cause skin sensitization or other allergic responses. See Section 11, "Other Studies Relevant to Material". Ingestion of very high levels may cause shock, coma or death. May cause pulmonary oedema or central nervous system (CNS) depression. Pulmonary oedema is 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. (4) 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.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

General Guidelines:	Prompt removal of the material and obtaining medical attention are essential for all contact. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water. Continue the flushing during transportation to the emergency department. Corrosive effects may be delayed (up to 72 hours), and damage may occur without the sensation or onset of pain. Contact local poison control centre for further guidance.
Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.
Skin Contact:	Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of soap and water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. Cover the exposed part with a clean, preferably sterile, lint-free dressing. Obtain medical attention IMMEDIATELY and monitor breathing and treat for shock for severe exposure. See "Note to Physicians" below.
Eye Contact:	Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport. Where possible, consult an ophthamologist.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. IMMEDIATELY contact local Poison Control Centre. If victim is alert and not convulsing, rinse mouth out and give 1 to 2 glasses of milk. Water may be used if milk is not available but it is not as effective. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more milk or water. IMMEDIATELY transport victim to an emergency facility. Do not attempt to neutralize the acid with weak bases since the exothermic reaction may extend the corrosive injury. Do not use buffering agents (e.g., antacids) they produce significant exothermic reactions without significantly altering the pH. Since reexposure of the mucosa to acid is harmful, be careful to avoid further vomiting and limit fluid to one to two glasses for an adult. (3)

Note to Physicians: Treatment for corrosive chemical contact with skin after initial flushing procedures:

1. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible.

2. Remove anything that is constrictive, such as rings, bracelets or footwear, before swelling begins.

3. Cover the exposed part with a clean, preferably sterile, lint-free dressing.

4. For severe exposure, immediately seek medical attention and monitor breathing and treat for shock.

Immediate consultation with the local Poison Control Centre should be initiated. Severe and sometimes delayed (up to 72 hours) local and systemic reactions can occur.

Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation.

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.

Medical conditions that may be aggravated by exposure to this product include diseases of the skin, eyes or respiratory tract.

5. FIRE-FIGHTING MEASURES

		F L A :	
Flashpoint (°C)	***AutoIgnition Temperature (°C)***	***LEL***	***UEL***
Non-combustible (does not burn).	Not applicable.	Not applicable.	Not applicable.

Flammability Class (WHMIS): Not regulated.

Hazardous Combustion Products: Thermal decomposition products are toxic and may include oxygen, chlorine gas, oxides of chlorine and sodium. Sodium Hypochlorite solutions decompose slowly. Decomposition is accelerated by heat (temperatures above 40 °C) and light. (4)

Unusual Fire or Explosion Hazards: Solutions non-flammable by themselves, but are strong oxidizers which can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants. Sodium Hypochlorite is a strong oxidant, but solutions do not support combustion.

If mixed with acids or warmed to temperatures greater than 40 degrees Celsius, Sodium Hypochlorite solutions release Chlorine gas. Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Damp material may decompose exothermically and may cause combustion of organic material. (4) 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: Sodium hypochlorite solutions do not burn. Extinguish fire using extinguishing agents suitable for the surrounding fire and not contraindicated for use with sodium hypochlorite.

DO NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters:	Fire-exposed containers should be kept cool by spraying with water to reduce pressure. This should be done from a safe distance since containers may rupture. Spilled material may cause floors and contact surfaces to become slippery.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing. Protective clothing for skin and eye protection should be worn to protect against highly alkaline materials.

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. See Section 13, "Deactivating Chemicals". Wear respirator, protective clothing and gloves. Spilled material may cause floors and contact surfaces to become slippery. Do not use combustible materials such as sawdust as an absorbent. For small spill, absorb with an inert dry material. For large spill, absorb with dry earth, sand or other non-combustible material. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere. Use spark-resistant tools. Eliminate all sources of ignition. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes 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. Containers 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. When diluting, add this material/product to water in small amounts to avoid spattering. Never add water to this material/product. Clean all containers of residues before adding the product. This will avoid potential violent reaction with unknown residues. (3) Add small quantities of this material slowly to large quantities of water, stirring constantly all the while. Constant stirring is necessary to avoid concentration of the product at the bottom of the mix vessel. Such concentration of the product may result in a violent exotherm with boiling of the liquid resulting in splashing, spattering or a violent eruption of a highly corrosive solution if the addition is too rapid or without sufficient stirring.
Ventilation Requirements:	Do not use in poorly ventilated or confined areas without proper respiratory protection. See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing aerosols (vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Corrosive residue is most likely to be deposited at process vents or storage tanks, especially during filling operations. The use of compressed air to force corrosive materials from delivery trucks is of special concern. Scrubbing the exhaust of these vents is highly recommended. Jurisdictional regulations should be consulted to determine required practices.

STORAGE

Storage Temperature (°C):	Store below 29 °C. Do not freeze.
Ventilation Requirements:	Ventilation should be corrosion proof. Strong solutions (greater than 10% available Chlorine) may slowly give off oxygen during storage, especially when warm (above 18 degrees Celsius). Vent caps may be required to prevent a build-up of pressure that could cause containers to burst.
Storage Requirements:	Store in a clean, cool well ventilated area, away from organic chemicals, strong bases, strong acids, metal powders, carbides, sulfides, and any readily oxidizable material. Protect from direct sunlight. Protect against physical damage. Storage area should be equipped with corrosion-resistant floors, sumps and should have controlled drainage to a recovery tank. Storage tanks should be in a contained area to control any spills or leaks. 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: polyethylene, polypropylene, PVC, Teflon, ceramic or Rubber lined steel. Equipment for storage, handling or transport should NOT be made from the following material, or, where applicable, its alloys: aluminum, stainless steel, cast iron, brass, bronze, nylon or phenolic resin. Some metals accelerate the decomposition of Sodium Hypochlorite. 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. Ventilation should be corrosion proof. 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 to prevent eye contact. Use full face-shield and 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 butyl rubber, neoprene, natural rubber, nitrile rubber, polyethylene, viton or PVC 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 full facepiece air-purifying respirator equipped with chlorine cartridges for concentrations up to 5 ppm for Chlorine vapours. An air-supplied respirator if concentrations are higher or unknown.
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)***
Decomposition Product: Chlorine	1 ppm	---		---	0.5 ppm (Ceiling)

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

Physical State:	Liquid.
Appearance:	Green to yellow, watery liquid with a chlorine (bleach) odour.
Odour:	Characteristic odour.
Odour Threshold (ppm):	Not available.
Boiling Range (°C):	40 (decompose). (3)
Melting/Freezing Point (°C):	-25 (12%). (3)
Vapour Pressure (mm Hg at 20° C):	17.5. (3)
Vapour Density (Air = 1.0):	Not available.
Relative Density (g/cc):	1.1 - 1.2. (4)
Bulk Density:	1 100 - 1 200 kg/m³.
Viscosity:	Similar to water.
Evaporation Rate (Butyl Acetate = 1.0):	Not available.
Solubility:	Miscible in water.
% Volatile by Volume:	Not available.
pH:	11- 14. (3)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not available.
Flashpoint (°C):	Non-combustible (does not burn).

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Unstable. Sodium Hypochlorite solutions decompose slowly. Decomposition is accelerated by heat (temperatures above 40 °C) and light. Some metals accelerate the decomposition of Sodium Hypochlorite.
Under Fire Conditions:	Not flammable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Temperatures above 40 °C (104 °F). Avoid direct sunlight. The heat of sunlight can contribute to instability. Avoid a decrease in pH.
Materials to Avoid:	Strong oxidizers. Strong acids. (hydrochloric acid) Contact with acids will liberate. corrosive chlorine gas. Reducing agents. Strong bases. Combustibles. Organic materials. Alcohols. Amines. Ethylene Glycol. Lewis or mineral acids. Methanol. Some metals accelerate the decomposition of Sodium Hypochlorite. Nickel. Copper. Cobalt. Tin.. Iron and its alloys. Manganese. Nitrogen containing compounds. Ammonium hydroxide and ammonium salts. Contact with nitrogen compounds (ammonia, urea, primary amines and isocyanurates) can form toxic, reactive chloramines. Contact with Ammonium salts can form explosive nitrogen trichloride if acid is present. (4) Incompatible materials for storage include aluminum, cast bronze, cast iron, stainless steel, brass, nylon and phenolic resin. (3)
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include oxygen, chlorine gas, oxides of chlorine and sodium. Sodium Hypochlorite solutions decompose slowly. Decomposition is accelerated by heat (temperatures above 40 °C) and light. (4)

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Sodium Hypochlorite	8910 mg/kg (3)	> 10 000 (1)	5250 mg/m3 (3)
Decomposition Product: Chlorine	---	---	147 ppm (1)

Carcinogenicity Data:	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.
Reproductive Data:	Reproductivity tests in animals have been negative.
Mutagenicity Data:	Mutagenicity tests in animals have been negative.
Teratogenicity Data:	No adverse teratogenic effects are anticipated.
Respiratory / Skin Sensitization Data:	Sodium Hypochlorite may cause skin sensitization or other allergic responses. Sensitization is the process whereby a biological change occurs in the individual because of previous exposure to a substance and, as a result, the individual reacts more strongly when subsequently exposed to the substance. Once sensitized, an individual can react to extremely low airborne levels, even below the TLV, or to skin contact.
Synergistic Materials:	None known.
Other Studies Relevant to Material:	Rats were fed drinking water containing 0, 0.025, 0.05, 0.1, 0.2 and 0.4% Sodium Hypochlorite for 13 weeks. Slight damage to the liver was observed in the 0.2 and 0.4% groups. Some organ weights (lungs, liver and spleen in males; salivary glands, lungs, heart and brain in females) were significantly lower in the high-dose group. (4) High doses of Sodium Hypochlorite in drinking water caused a small but significant increase in abnormal sperm in mice. (4) Sodium Hypochlorite caused mutations in several short-term studies using bacteria and cultured mammalian cells. The significance of these tests is unclear. It was not mutagenic in tests (chromosome aberration and micronucleus) on live animals. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Sodium Hypochlorite: 96-hour LC50 (Fathead minnows) = 5.9 mg/l (3) 48-hour LC50 (Rainbow Trout) = 0.07 mg/L (3)
Environmental Fate:	Not available. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. Can be dangerous if allowed to enter drinking water intakes.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	Apply cautiously a dilute solution of a reducing agent such as sodium sulphite or sodium bisulphite to the contained spill. Confirm pH using pH paper. Neutralization is expected to be exothermic. Effervescence may result. Flush spill area with water.
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 Section 13, "Deactivating Chemicals".
Disposal of Packaging:	Empty containers retain product residue (liquid and/or vapour) and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Treat package in the same manner as the product.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

HYPOCHLORITE SOLUTION, Class 8, UN1791, PG II.

Label(s): Corrosives. Placard: Corrosives.

ERAP Index: -----. Exemptions:

This product is NOT REGULATED BY TRANSPORT at a concentration below 7%.

US DOT CLASSIFICATION 49CFR 172.101 172.102 :

HYPOCHLORITE SOLUTION, Class 8, UN1791, PG II.

Label(s): Corrosive. Placard: Corrosive.

CERCLA-RQ: 100 lb/45.4 kg. Exemptions:

This product is NOT REGULATED BY TRANSPORT at a concentration below 7%.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR:	All components of this product are included on the DSL.
CEPA - NPRI:	Not included.

Controlled Products Regulations Classification (WHMIS):

D-2B: Toxic (skin sensitizer)
E: Corrosive

USA

Environmental Protection Act:	All components of this product are included on the TSCA inventory.
OSHA HCS (29CFR 1910.1200):	Skin Sensitizer. Corrosive.

NFPA: 3 Health, 0 Fire, 1 Reactivity (6)
HMIS: 3 Health, 0 Fire, 1 Reactivity (3)

INTERNATIONAL

All components of this product are found on the following inventories: Australia (ACOIN), China Inventory (IECS), EINECS (European Inventory of Existing Commercial Chemical Substances), Japan (MITI), Korea (ECL), New Zealand (NZloC) and Philippines Inventory of Chemicals and Chemical Substances (PICCS).

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.

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

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

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Phone: (902) 468-9690 Facsimile: (902) 468-3085

Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

MATERIAL SAFETY DATA SHEET

SULPHURIC ACID 51   100

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#:	00060799
Index:	GCD0052/13D
Effective Date:	2013 November 01
Date of Revision:	2013 November 01

EMERGENCY TELEPHONE NUMBER F E I C S R

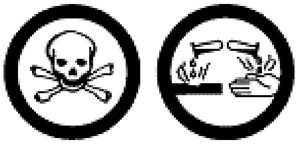
1 855 273 6824

PRODUCT IDENTIFICATION

Product Name:	Sulphuric Acid 51 - 100 %.
Chemical Name:	Sulphuric Acid.
Synonyms:	Oil of Vitriol; Hydrogen Sulphide; Battery Acid.
Chemical Family:	Inorganic Acid.
Molecular Formula:	H_2SO_4.
Product Use:	Fertilizer. Dyestuff. Electrical Batteries. Pulp and paper industry. Chemical intermediate.

WHMIS C S :

D-1A: Very Toxic (acute effects)
E: Corrosive



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*
Sulphuric acid	7664-93-9	0.2 mg/m³	*A2	51 - 100

A2 = Suspected Human Carcinogen (ACGIH-A2).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Corrosive! May be fatal if inhaled or swallowed. Toxic effects may be delayed. Causes severe skin and eye burns. Mists or sprays are extremely irritating to eyes and respiratory tract. Prolonged or repeated exposure may cause discoloration and erosion of teeth. See "Other Health Effects" Section. See Section 11, "Toxicological Information". Reacts with water. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation:	Corrosive! Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Prolonged or repeated exposure may cause discoloration and erosion of teeth. See "Other Health Effects" Section.

Skin Contact:	Corrosive! Burns can occur if not promptly removed. Concentrated solutions may cause pain and deep and severe burns to the skin. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin. Toxic effects may be delayed. Avoid handling when the skin is moist, wet or abraded.
Skin Absorption:	Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin.
Eye Contact:	Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur.
Ingestion:	Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur. Prolonged or repeated exposure may cause discoloration and erosion of teeth.
Other Health Effects:	Corrosive effects 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. May cause liver damage, kidney damage and cardiovascular effects. Signs and symptoms of kidney damage generally progress from oliguria, to blood in the urine, to total renal failure. 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.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.
Skin Contact:	Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Obtain medical attention IMMEDIATELY.
Eye Contact:	Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. IMMEDIATELY contact local Poison Control Centre. If victim is alert and not convulsing, rinse mouth out and give 1 to 2 glasses of milk. Water may be used if milk is not available but it is not as effective. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more milk or water. IMMEDIATELY transport victim to an emergency facility.
Note to Physicians:	Do not attempt to neutralize the acid with weak bases since the exothermic reaction may extend the corrosive injury. Do not use buffering agents (e.g., antacids) they produce significant exothermic reactions without significantly altering the pH. Since reexposure of the mucosa to acid is harmful, be careful to avoid further vomiting and limit fluid to one to two glasses for an adult. (3) Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation. 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. Medical conditions that may be aggravated by exposure to this product include diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE-FIGHTING MEASURES

		FLA:	
Flashpoint (°C)	***AutoIgnition Temperature (°C)***	***LEL***	***UEL***
Non-combustible (does not burn).	Not applicable.	Not applicable.	Not applicable.

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include oxides of sulphur and irritating gases.
Unusual Fire or Explosion Hazards:	Avoid direct contact of this product with water as this can cause a violent exothermic reaction. Closed containers exposed to heat may explode. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air.
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:	Do not use water. Use media appropriate for surrounding fire and/or materials. Use water only to keep non-leaking, fire-exposed ontainers cool. If water is used, care should be taken, since it can generate heat and cause spattering if applied directly to sulphuric acid. (4)

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters:	Fire-exposed containers should be kept cool by spraying with water to reduce pressure. Spilled acid may cause floors and contact surfaces to be come slippery.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing. Protective clothing for skin and eye protection should be worn to protect against corrosive materials.

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. See Section 13, "Deactivating Chemicals". Wear protective clothing. Do not use combustible materials such as sawdust as an absorbent. Spilled acid may cause floors and contact surfaces to be come slippery. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes 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:	Exposure to any mist or aerosol during the use of this product should be avoided and, in any case, keep exposures below the occupational exposure limit for Sulphuric Acid. (3) Do not store or transport with food or feed. Use normal "good" industrial hygiene and housekeeping practices. Containers 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. When diluting, add this material/product to water in small amounts to avoid spattering. Never add water to this material/product.
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing aerosols (vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Acid mist is most likely to be generated at the vents of process or storage tanks, especially during filling operations. The use of compressed air to force acids from delivery trucks is of special concern. Scrubbing the exhaust of these vents is highly recommended. Jurisdictional regulations should be consulted to determine required practices.

STORAGE

Storage Temperature (°C):	Not available.
Ventilation Requirements:	Ventilation should be corrosion proof.
Storage Requirements:	Store in a clean, cool well ventilated area, away from organic chemicals, strong bases, strong acids, metal powders, carbides, sulfides, and any readily oxidizable material. Protect from direct sunlight. Protect against physical damage. Avoid moisture contamination. Hygroscopic. Substances that readily absorb water are termed "Hygroscopic". Storage tanks should be in a contained area to control any spills or leaks. Storage area should be equipped with acid-resistant floors, sumps and should have controlled drainage to a recovery tank.
Special Materials to be Used for Packaging or Containers:	Materials of construction for storing the product include: carbon steel, stainless steel, plastics, polyethylene, Teflon, viton or ceramic. Equipment for storage, handling or transport should NOT be made from the following material, or, where applicable, its alloys: aluminum, copper, cast iron, CPVC, epoxy, nylon, silicone, titanium and mild steel. Attacks some types of rubber, plastics and coatings. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air. Confirm suitability of any material before using. Storage tanks for sulphuric acid of 93% - 99% are usually fabricated from carbon steel. At normal temperatures there is some attack on the steel resulting in the evolution of hydrogen gas and the formation of iron sulphate, most of which settles to the bottom of the tank. Wall thickness should be carefully calculated to provide corrosion allowance for the high specific gravity of the acid. (3)

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. Ventilation should be corrosion proof. 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 to prevent eye contact. Use full face-shield and 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 butyl rubber or viton 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 full facepiece air-purifying respirator equipped with acid gas, dust, mist, fume cartridges for concentrations up to 10 mg/m³ (Sulphuric Acid). Charcoal filters should not be used as they are not compatible with oxidizers. 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) Sulphuric Acid: Immediately Dangerous to Life and Health (IDLH) value: 15 mg/m³. The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory equipment. In the event of failure of respiratory protective equipment, every effort should be made to exit immediately. (4)
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 (STEL)***	***OSHA PEL (TWA)***	***OSHA PEL (STEL)***	***NIOSH REL (TWA)***	***NIOSH REL (STEL)***
Sulphuric acid	—	1 mg/m³	---	1 mg/m³	---

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

Physical State:	Liquid.
Appearance:	Colourless to pale yellow, viscous liquid.
Odour:	Strong, pungent odour.
Odour Threshold (ppm):	Poor warning properties.
Boiling Range (°C):	280 (93%)
Melting/Freezing Point (°C):	-35 (93%)
Vapour Pressure (mm Hg at 20° C):	< 0.3 (93%)
Vapour Density (Air = 1.0):	3.4.
Relative Density (g/cc):	1.48 - 1.84.
Bulk Density:	1 480 - 1 840 kg/m³.
Viscosity:	25 cPs (25°C).
Evaporation Rate (Butyl Acetate = 1.0):	Not available.
Solubility:	Soluble in water.
% Volatile by Volume:	Not available.
pH:	< 0.3 (93%)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not applicable.
Flashpoint (°C):	Non-combustible (does not burn).

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not flammable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Avoid contact with water. Do not store in humid places. Hygroscopic. Substances that readily absorb water are termed "Hygroscopic". Avoid temperatures above: 300 °C.
Materials to Avoid:	Nitro compounds, carbides, dienes, alcohols (when heated): causes explosions. Oxidizing agents, such as chlorates and permanganates: causes fires and possible explosions. Allyl compounds and aldehydes: undergoes polymerization, possibly violent. Alkalies, amines, water, hydrated salts, carboxylic acid anhydrides, nitriles, olefinic organics, glycols, aqueous acids: causes strong exothermic reactions. Carbonates, cyanides, sulfides, sulfites, metals such as copper: yields toxic gases. Violently reactive with: Sodium Chlorite. Reducing agents. Strong bases. Combustibles. Metals. Alkali metals and their hydroxides. Organic materials. Aluminum and its alloys. Copper and its alloys. Cast Iron. Mild steel. Titanium. Attacks some types of rubber, plastics and coatings. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include oxides of sulphur and irritating gases.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Sulphuric acid	2 140 mg/kg (1)	---	255 mg/m³ (1)

Carcinogenicity Data:	The International Agency for Research on Cancer (IARC) reviewed many studies that have reported increased rates of cancer of the larynx, and to a lesser extent the lungs, in workers exposed in a wide variety of processes to strong inorganic acid mists including sulphuric acid mists. A more recent case study and a follow-up to one of the IARC-reviewed studies confirmed this conclusion. Examples of the processes studied included pickling, electroplating and other acid treatment of metals, the manufacture of lead-acid batteries and phosphate fertilizer production. (4) The International Agency for Research on Cancer (IARC) has not evaluated the carcinogenicity of Sulphuric Acid. However, IARC has concluded there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulphuric acid is carcinogenic to humans (Group 1). IARC's classification is for inorganic acid mists containing sulphuric acid and does not apply to sulphuric acid or sulphuric acid solutions. (4) The American Conference of Governmental Industrial Hygienists (ACGIH) has not assigned a carcinogenicity designation to this chemical. However, ACGIH has designated strong inorganic acid mists contained sulphuric acid as A2 (suspected human carcinogen). The US National Toxicology Program (NTP) has not listed this chemical in its report on carcinogens. However, the US NTP has listed strong inorganic acid mists containing sulphuric acid as a known human carcinogen. (4) Sulphuric Acid as aerosol or mist is classified as a suspected carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) and IARC.
Reproductive Data:	No adverse reproductive effects are anticipated.
Mutagenicity Data:	There were no mutagenicity studies specific for Sulphuric Acid. However, there are established effects of reduced pH in mutagenicity testing, as would be caused by Sulphuric Acid. These effects are an artifact of low pH and are not necessarily due to biological effects of Sulphuric Acid itself. (4)
Teratogenicity Data:	Sulphuric Acid was not teratogenic in mice or rabbits, but was slightly embryotoxic in rabbits (a minor rare skeletal variation). The animals were exposed to 5 and 20 mg/m^3 (1.6 and 2.4 um respectively) for 7 hours/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species. (4)
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	None known.

Other Studies Relevant to Material:

Human volunteers exposed for 5 - 15 minutes noticed no odour or irritation at concentrations of Sulphuric Acid below 1 mg/m^3. At concentrations of 3 mg/m^3 and 5 mg/m^3 the exposure was found to be objectionable. A deep breath usually produced coughing and there were respiratory changes. In another study, volunteers with high exposures (39 mg/m^3 dry mists and 21 mg/m^3 wet mist) for 30 to 60 minutes experienced severe symptoms of irritation of the upper airways and signs of bronchial obstruction. These symptoms persisted for several days in two volunteers. A worker overcome by Sulphuric Acid fumes while working in a closed space experienced injury to the upper airways, fluid accumulation and bleeding in the lungs. At a six week follow-up, most lung function tests were normal. (4)

Exposure to high concentrations (reported up to 16 mg/m^3) caused dental erosion. Etching of the teeth may occur after a few weeks exposure, progressing to erosion after a few months exposure. Dental etching and erosion occurred about 4 times as frequently in a high exposure group (over 0.3 mg/m^3) compared to a low exposure group (0.07 mg/m^3). (4)

Application of a 1 % solution caused tissue death (necrosis) in the eye. Application of a 5 % solution, rinsed with water, caused clouding of the cornea and irritation which cleared within 7 days; a 10 % solution caused severe irritation and damage which persisted to day 7. (4)

Low concentrations of aerosols have produced changes in lung function. There is species variation in sensitivity with guinea pigs being the most sensitive, then rats and mice, with rabbits the most resistant. The aerosol toxicity was dependent on particle size. (4)

No harmful changes were observed in rats following one week exposure to concentrations of Sulphuric Acid up to 100 mg/m^3, while 30 mg/m^3 caused fatal accumulation of fluid in the lungs of guinea pigs. The animals that died probably suffocated following laryngeal spasm. The lowest concentration at which guinea pigs showed increased airway resistance was 0.1 mg/m^3. There were no cardiovascular effects in dogs exposed briefly to 8 mg/m^3 or to 4 mg/m^3 for 4 hours. (4)

Chronic exposure to low concentrations by inhalation have produced changes in respiratory tissues and in measures of lung function. (4)

In 3 studies, guinea pigs were exposed to Sulphuric Acid concentrations ranging from 0.1 to 26.5 mg/m^3 and particle sizes that range from fine to coarse for periods of 18 to 140 days. Intermittent exposure produced only minimal lung changes while continuous exposures at lower concentrations (4 mg/m^3) caused more extensive damage. Changes were most marked for exposures with particle size of 0.9 um. No effects were seen at the lowest concentration (0.1 mg/m^3). (4)

Monkeys were continuously exposed for 78 weeks to two different concentrations of Sulphuric Acid and two different particle sizes. Effects on pulmonary function and respiratory cells were seen at 4.79 mg/m^3 (particle size of 0.73 um). At 0.48 mg/m^3 (0.54 um) and 0.38 mg/m^3 (2.15 um), only minimal effects were noted. In a guinea pig study, there were no effects following continuous exposure to 0.1 and 0.08 mg/m^3 for 52 weeks. (4)

Factors such as muscociliary clearance, alveolar defense mechanisms, cellular changes and lung function have been evaluated in many studies. While changes in these parameters have been demonstrated, it is not clear whether they relate to chronic lung disease. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Harmful to aquatic life at low concentrations. Toxicity is primarily associated with pH. Acidic soil conditions can develop with product present. Higher than normal toxic heavy metal concentrations can then occur in ground and surface waters.

Sulphuric Acid:
48-hour LC50 (Flounder) = 100 - 300 mg/L (4)

Environmental Fate:

Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. This product does not bioaccumulate in aquatic or terrestrial food chains.

Sulphuric Acid will ultimately react with calcium and magnesium in water to form Sulphate salts. Sulphuric Acid has led to increased weathering from soils and rocks so that the calcium ion rises in concentration in waters above pH 6 and also in those below pH 5. (4)

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:

Neutralize carefully with soda ash or sodium bicarbonate to a pH of 6 to 9. Check for a neutral pH using pH paper. Neutralization is expected to be exothermic. Vigourous effervescence results.

Waste Disposal Methods:	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. 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.
Safe Handling of Residues:	See "Waste Disposal Methods".
Disposal of Packaging:	Empty containers retain product residue (liquid and/or vapour) and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Do not dispose of package until thoroughly washed out.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

SULPHURIC ACID, Class 8, UN1830, PG II.

Label(s): Corrosives. Placard: Corrosives.

ERAP Index: 3000. Exemptions: None known.

Do not store or transport with food or feed.

US DOT CLASSIFICATION 49CFR 172.101 172.102 :

SULPHURIC ACID, Class 8, UN1830, PG II.

Label(s): Corrosive. Placard: Corrosive.

CERCLA-RQ: 1 000 lb / 454 kg. Exemptions: Not available.

Do not store or transport with food or feed.

15. REGULATORY INFORMATION

CANADA

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

Controlled Products Regulations Classification (WHMIS):

D-1A: Very Toxic (acute effects)
E: Corrosive

USA

Environmental Protection Act:	All components of this product are included on the TSCA inventory.
OSHA HCS (29CFR 1910.1200):	Highly Toxic, Corrosive.

NFPA: 3 Health, 0 Fire, 2 Reactivity (3)
HMIS: 3 Health, 0 Fire, 2 Reactivity (3)

INTERNATIONAL

The following component or components of this product appear on the European Inventory of Existing Commercial Chemical Substances: Sulphuric Acid.

16. OTHER INFORMATION

ADDITIONAL INFORMATION

The Baume Scale:

% H2SO4	Specific Gravity at 15.6 Degrees Celcius	Degrees Baume (3)
10.77	1.0741	10
11.89	1.0821	11
13.01	1.0902	12
14.13	1.0985	13
15.25	1.1069	14
16.38	1.1154	15

17.53	1.1240	16
18.71	1.1328	17
19.89	1.1417	18
21.07	1.1508	19
22.25	1.1600	20
23.43	1.1694	21
24.61	1.1789	22
25.81	1.1885	23
27.03	1.1983	24
28.22	1.2083	25
29.53	1.2185	26
30.79	1.2288	27
34.63	1.2609	30
41.27	1.3182	35
48.10	1.3810	40
49.47	1.3942	41
50.87	1.4087	42
52.26	1.4216	43
53.66	1.4356	44
56.48	1.4646	45
59.32	1.4948	48
60.75	1.5104	49
62.18	1.5263	50
65.13	1.5591	52
68.13	1.5934	54
71.17	1.6292	56
74.36	1.6667	58
77.67	1.7059	60
90.60	1.8239	65.5
93.00	1.8347	65.97
94.00	1.8381	66.1
98.00	1.8437	Not listed.

REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
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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.

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