Appendix J
Material Safety Data Sheets

Material Safety Data Sheet

LA5851
Citric Acid Anhyd USP/FCC Fine F6000

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA5851
Product Name: Citric Acid Anhyd USP/FCC Fine F6000
Synonyms: 2-Hydroxy-1,2,3 Propanetricarboxylic Acid
Chemical Family: Organic Acid
Application: Widely used acidulant for flavoring, beverages, food, and as a basic chemical.

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: 24 August 2007
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:
Citric acid 77-92-9	100	Oral LD50 (Rat) 3000 mg/kg

Note: No additional remark.

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: May cause irritation with redness, pain, possible eye burns, conjunctivitis, ulceration and permanent cloudiness.
Skin Contact: Causes irritation with discomfort, local redness, and possible swelling. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
Inhalation: May cause mucous membrane irritation with sore throat, coughing and shortness of breath.
Ingestion: If large amounts of the product are ingested, symptoms may include gastrointestinal irritation, nausea, vomiting and diarrhea.

4. FIRST AID MEASURES

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.
Skin Contact: Flush with copious amounts of water for at least 15 minutes. If irritation persists or signs of toxicity occur, seek medical attention.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Notes to Physician: Treatment based on sound judgment of physician and individual reactions of patient.

5. FIRE FIGHTING MEASURES

Flash Point: None.
Flash Point Method: Not applicable.
Autoignition Temperature: 345 °C / 653 °F
Flammable Limits in Air (%): Lower: 8 gram/cubic feet Upper: 65 gram/cubic feet
Extinguishing Media: Use DRY chemicals, CO2, alcohol foam or water spray.
Special Exposure Hazards: May form explosive dust-air mixtures. Keep containers cool to prevent rupture and release of material.
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 1, FLAMMABILITY 0, INSTABILITY 0
HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 1, FLAMMABILITY 0, REACTIVITY 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed.
Procedure for Clean Up: Isolate hazard area and restrict access. Scoop up or vacuum up and place in an appropriate closed container.

7. HANDLING AND STORAGE

Handling: Avoid breathing in dust. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid dust generation and provide for room ventilation during handling. Avoid air conveying of powdered product due to potential of static buildup. Keep the containers closed when not in use. Empty containers may contain hazardous product residues.
Storage: Store in a cool, dry, well ventilated area. Keep containers tightly closed. Store in accordance with good industrial practices. Avoid storage with incompatible materials. Storage pressure: atmospheric.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Use local exhaust or general room/dilution ventilation sufficient to maintain employee exposure below permissible exposure limits.
Respiratory Protection: Use a NIOSH approved dust respirator.
Gloves:

Impervious gloves.
Skin Protection: Normal work coveralls.
Eyes: Safety glasses with side shields or chemical goggles.
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
Citric acid	Not available.	Not available.	Not Available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Powder
Colour: Colourless - White.
Odour: Odourless
pH 2.2 (1%), 1.8 (5%), 1.7 (10%), 0.8 (50%)
Specific Gravity: 1.665 @ 20 deg C
Boiling Point: 175 °C / 347 °F (decomposes)
Freezing/Melting Point: 153 °C / 307 °F
Vapour Pressure: Not Available.
Vapour Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: 0
Solubility: Soluble in water. Soluble in methanol.
VOCs: Not Available.
Viscosity: Not Available.
Molecular Weight: Not Available.
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Avoid conditions that generate dust.
Materials to Avoid: Strong alkalis. Strong oxidizers.
Hazardous Decomposition Products: Oxides of carbon.
Additional Information:

No additional remark.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: If large amounts of the product are ingested, symptoms may include gastrointestinal irritation, nausea, vomiting and diarrhea.
Skin Contact: Causes irritation with discomfort, local redness, and possible swelling. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
Inhalation: May cause mucous membrane irritation with sore throat, coughing and shortness of breath.
Eye Contact: May cause irritation with redness, pain, possible eye burns, conjunctivitis, ulceration and permanent cloudiness.

Additional Information: Pre-existing eye and skin disorders may be aggravated by exposure to this product. Long term oral overexposure may cause damage to tooth enamel.

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
Citric 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
Citric acid	LC50/96h/goldfish : 440-706 mg/l	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 Proper 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:
Citric acid	Not Listed.	Not Listed.	Not Listed.

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

WHMIS Hazardous Class:
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.

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

Material Safety Data Sheet

LA3651
Ferric Chloride Solution Min. 38-47%

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA3651
Product Name: Ferric Chloride Solution Min. 38-47%
Synonyms: Iron (III) Chloride
Chemical Family: Inorganic salts.
Application: Water treatment (potable and waste water). Odor removal. Adhesive for Dye, Textile Impression Pigment, Ink and Photoengraving

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: 04 January 2008
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:
Ferric Chloride 7705-08-0	38-47	Oral LD50 (Rat) 895 mg/kg Dermal LD50 (Rabbit) >2000 mg/kg
Hydrochloric acid 7647-01-0	1-5	Aerosol LC50 Rat : 8300 mg/m^3 Aerosol LC50 Mouse : 3200 mg/m^3 (30 minutes)

Note: No additional remark.

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: Causes moderate eye irritation.
Skin Contact: May cause skin irritation.
Inhalation: May irritate mouth, nose, and throat.
Ingestion: May be harmful if swallowed.

4. FIRST AID MEASURES

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.
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: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Notes to Physician: Treatment based on sound judgment of physician and individual reactions of patient.

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: Emits toxic fumes under fire conditions.
Hazardous Decomposition/Combustion Materials (under fire conditions): Hydrogen chloride. Phosgene.
Special Protective Equipment: Wear protective clothing and self-contained breathing apparatus.
NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 0, INSTABILITY 1
HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 0, REACTIVITY 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Ventilate spill area if possible. Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed.
Procedure for Clean Up: Stop leak only if safe to do so. Isolate hazard area and restrict access. Neutralize with lime slurry, limestone, or soda ash. Absorb with an inert dry material and place in an appropriate waste disposal container. Flush area with water to remove trace residue.

7. HANDLING AND STORAGE

Handling: Avoid breathing vapors, mist, fume or dust. Avoid contact with eyes, skin and clothing. Handle and open containers with care. Use caution when handling any chemical substance. Keep the containers closed when not in use. Empty containers may contain hazardous product residues. When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accesories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. Hepa or air supplied respirator, full Tyvek coveralls with head cover, or chemical suits, gloves and boots are suggested.
Storage: Store in a cool, dry, well ventilated area. Do not store in metal containers, because the metal will dissolve and generate hydrogen. Vent rubber lined steel containers to avoid pressure build up if the lining fails. Avoid storage with incompatible materials. Product should be used within one (1) year.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Local exhaust ventilation as necessary to maintain exposures to within applicable limits.
Respiratory Protection: If airborne concentrations exceed the Occupational Exposure Limit, use a NIOSH/MSHA approved full facepiece respirator with acid gas cartridges.
Gloves:

Impervious gloves. Neoprene 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
Ferric Chloride	1 mg/m^3 TLV-TWA	1 mg/m^3 TWA	Not Available.
Hydrochloric acid	2 ppm Ceiling	5 ppm Ceiling 7 mg/m^3 Ceiling	50 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.
Colour: Reddish Brown
Odour: Slight Pungent
pH <2
Specific Gravity: 1.26 - 1.48
Boiling Point: 105-110°C / 220-230°F
Freezing/Melting Point: Not Available.
Vapour Pressure: Negligible.
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: Not Available.
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Excessive heat.
Materials to Avoid: Strong acids. Strong bases. Strong reducing agents. Mineral acids. Alkalis. Metals and alloys.
Hazardous Decomposition Products: Hydrogen chloride. Phosgene.
Additional Information:

No additional remark.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: May be harmful if swallowed.
Skin Contact: May cause skin irritation.
Inhalation: May irritate mouth, nose, and throat.
Eye Contact: Causes moderate eye irritation.

Additional Information:
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
Ferric Chloride	Not listed.	Not listed.
Hydrochloric acid	Group 3	A4 - Not Classifiable as a Human Carcinogen

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
Ferric Chloride	LC50 (Morone saxatilis) 6 mg/L LC50 (Gambusia affinis) 75.6 mg/L	Not Available.	Not Available.
Hydrochloric acid	LC50 (Gambusia affinis) 282 mg/L LC50 (Lepomis macrochirus) 3.6 mg/L	Not Available.	Not Available.

Other Information:
No additional remark.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed in accordance with all federal, provincial and local laws.
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: Ferric Chloride Solution
DOT Hazardous Class 8
DOT UN Number: UN2582
DOT Packing Group: III
DOT Reportable Quantity (lbs): Not Available.
Note: No additional remark.
Marine Pollutant: No.

TDG (Canada):
TDG Proper Shipping Name: Ferric Chloride Solution
Hazard Class: 8
UN Number: UN2582
Packing Group: III
Note: No additional remark.
Marine Pollutant: No.

15. REGULATORY INFORMATION

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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:
Ferric Chloride	Not Listed.	Listed	Not Listed.
Hydrochloric acid	Listed	Listed	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:
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.

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

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SECTION I: CHEMICAL PRODUCT & COMPANY INFORMATION

MARTIN MARIETTA MAGNESIA SPECIALTIES LLC
195 Chesapeake Park Plaza, Suite 200
BALTIMORE, MARYLAND 21220-0470
(410) 780-5500

MSDS #: 3710

DATE: June 11, 2008

Emergency Phone: (800) 424-9300 CHEMTREC

PRODUCT NAME(S): **FloMag H**

CHEMICAL DESCRIPTION: Magnesium Hydroxide Slurry, Aqueous
FORMULA: Mg(OH)2

SECTION II: COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENT	CAS No	Approx Wt %	LD50 or LC50 (species/route)
Magnesium Hydroxide	01309-42-8	60-100	No data available
Magnesium oxide *FUME*	01309-48-4	unknown	TCLo 400 mg/m3 (human/inhalation)

Magnesium oxide *FUME* may be generated in a reducing environment when temperatures exceed 1700C.

SECTION III: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product contains mechanical irritants to skin, eyes and respiratory tract and may present a nuisance dust hazard if allowed to dry out. Avoid breathing dust. Avoid contact with skin. Wear protective clothing including gloves, goggles or safety glasses with side shields and NIOSH approved dust mask. Magnesium oxide FUME may be generated in a reducing environment when temperatures exceed 1700°C (3092°F).

EFFECTS OF ACUTE EXPOSURE: Ingestion generally causes purging of the bowels, however, swallowing large amounts may lead to bowel obstruction. If allowed to dry out, dust may irritate eyes, skin, nasal passages and respiratory tract. If heated over 1700°C (in a reducing environment), inhalation of freshly generated magnesium oxide fume may result in metal fume fever.

EFFECTS OF CHRONIC EXPOSURE: No data available.

SIGNS & SYMPTOMS OF EXPOSURE:

INHALED DUST: sneezing, coughing, discolored sputum

INHALED FUME: metal fume fever has influenza-like symptoms including fever, chills, perspiration, cough, nasal irritation, chest pain,

nausea, head aches, vomiting and muscular weakness. Symptoms may be delayed 1-3 hours after exposure however no reports of such exposures from industrial contact have been reported.

EYE CONTACT: redness, tearing, conjunctivitis.

SKIN CONTACT: drying, chapping, dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: As with exposure to any environment without adequate personal protection, inhalation of magnesium oxide dust or fume may aggravate any pre-existing respiratory disease; prolonged/frequent skin contact may lead to dermatitis.

SECTION IV: FIRST AID MEASURES

INHALATION: Remove to fresh air immediately. Do not permit exposed person to remain in dusty environment without adequate respiratory protection. Treat metal fume fever with bed rest and treat for fever and pain.

EYE CONTACT: Do not rub eyes. Wash eyes under slowly running water for at least fifteen minutes, making sure eyes are held wide open and moved slowly in every direction. Ensure no solid particles remain in creases of eyelids. If so, continue to wash. If irritation persists, consult an ophthalmologist.

SKIN CONTACT: Remove from source of irritation. Remove contaminated clothing and wash affected area thoroughly with a mild soap and water. Wash contaminated clothing before reusing.

INGESTION: Treat symptomatically. If bowel obstruction occurs, immediately consult a physician.

SECTION V: FIRE FIGHTING MEASURES

FLASH POINT (METHOD): Product is not flammable or combustible.
AUTO-IGNITION TEMP: Not applicable *LEL:* Not applicable *UEL:* Not applicable
SENSITIVE TO MECHANICAL IMPACT? No *SENSITIVE TO STATIC DISCHARGE?* No
FLAMMABILITY CLASSIFICATION: Not flammable *CONDITIONS OF FLAMMABILITY:* Not flammable

EXTINGUISHING MEDIA: Use media appropriate to primary source of fire. Otherwise, use dry chemical, carbon dioxide, water spray or foam.

SPECIAL FIREFIGHTING PROCEDURES: No special procedures; avoid breathing fumes or dust; keep upwind.

UNUSUAL FIRE & EXPLOSION HAZARDS: None known.
HAZARDOUS COMBUSTION PRODUCTS: None known.

SECTION VI: ACCIDENTAL RELEASE MEASURES

Ventilate enclosed spaces and use appropriate respiratory protection. Sweep or vacuum spilled material in a manner to

avoid generation of dust. Reclaim product for re-use, if possible, or collect in containers for disposal in an appropriate manner.

SECTION VII: HANDLING & STORAGE

HANDLING PROCEDURES AND EQUIPMENT: Keep container closed when not in use. Avoid contact with eyes. Avoid breathing dust or fume and only use in a well ventilated area. Consumption of food and beverages should be avoided in work area where product is being used. After handling product, always wash hands and face thoroughly with soap and water before eating, drinking or smoking.

STORAGE REQUIREMENTS: Suitable for any general chemical storage area.

SECTION VIII: EXPOSURE CONTROLS / PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS: Local and general mechanical dust collection and ventilation in accordance with good engineering practices should be provided to maintain dust levels below permissible exposure levels specified in Section VIII.

PERSONAL PROTECTIVE EQUIPMENT:

GLOVES: Dust impervious gloves during manual handling of product.
EYES: Safety glasses with side-shields or tight fitting goggles.
FOOTWEAR: Steel reinforced shoes when handling pallets of product.
CLOTHING: Long sleeves, buttoned collar, long pants extended over shoes or coveralls.

RESPIRATORY - UP TO 100 MG/M3: Any dust, mist or fume respirator; any air supplied respirator; or, self-contained breathing apparatus.

UP TO 250 MG/M3: Any supplied air respirator operated in a continuous flow mode or any powered air purifying respirator with a dust/mist/fume filter.

UP TO 500 MG/M3: High efficiency particulate filter with full face piece; any powered air supplied respirator with a tight fitting face piece and a high efficiency particulate filter; any self contained breathing apparatus with a full face piece; any supplied air respirator with a full face piece.

UP TO 7500 MG/M3: Any air supplied respirator with full face piece and operated in a pressure demand or other positive pressure mode.

EMERGENCY or ENTRY INTO UNKNOWN CONCENTRATIONS: Self contained breathing apparatus with full face piece and operated in pressure demand mode or air supplied respirator with full face piece operated in a pressure demand or other positive pressure mode in combination with auxiliary self contained breathing apparatus operated in pressure demand or positive pressure mode.

ESCAPE: Any air purifying full face piece respirator with high efficiency particulate filter or any appropriate escape

type self contained apparatus.

EXPOSURE LIMITS

Magnesium hydroxide: No exposure limits established by OSHA, ACGIH or NIOSH.

If magnesium hydroxide is heated over 1700°C (in a reducing environment), magnesium oxide fume may be generated. Exposure limits for magnesium oxide fume include:

ACGIH - Time Weighted Averages Magnesium oxide fume 10 mg/m3 TWA
ACGIH - TLV Basis: Critical Effects Magnesium oxide fume irritation; metal fume fever

Australian Exposure Standards Magnesium oxide fume 10 mg/m3 TWA

California - Exposure Limits: PELs Magnesium oxide fume as Mg: 10 mg/m3

Canada - Alberta -

15 Minute Occupational Exposure Limit Magnesium oxide fume 20 mg/m3 STEL

8 Hour Occupational Exposure Limit Magnesium oxide fume as Mg: 10 mg/m3 TWA

Canada - British Columbia -

15 Minute Exposure Limits Magnesium oxide fume 10 mg/m3

8 Hour Exposure Limits Magnesium oxide fume as Mg;

Total dusts: 10 mg/m3 TWA;
Respirable dust and fumes: 3 mg/m3 TWA

Canada - Ontario -

OHSA - TWAEVs Magnesium oxide fume 10 mg/m3 TWAEV

Proposed Occupational STEVs 5 mg/m3 STEV

Canada - Quebec - Magnesium oxide fume

Time-Weighted Average Exposure Magnesium oxide fume as Mg: 10 mg/m3 TWAEV

German (DFG) -

MAK Values Magnesium oxide fume respirable fraction: 1.5 mg/m3 MAK (includes magnesium oxide fume)

Peak Limitations Magnesium oxide fume 2 x normal MAK (30 min. average value); don't exceed 4 times during shift; half-life <2h

Israel -

Action Levels Magnesium oxide fume 5 mg/m3 AL

Time Weighted Averages Magnesium oxide fume 10 mg/m3 TWA

Mexico - Instruction No. 10 - TWAs Magnesium oxide fume 10 mg/m3 TWA

US - OSHA -

Final PELs: Time Weighted Average Magnesium oxide fume total particulate: 15 mg/m3 TWA

Vacated PELs: Time Weighted Avg Magnesium oxide fume total particulate: 10 mg/m3 TWA

United Kingdom -

Occupational Exposure Standard:STEL Magnesium oxide fume fume and respirable dust, as Mg: 10 mg/m3 STEL

Occupational Exposure Standards:TWA Magnesium oxide fume fume and respirable dust, as Mg: 5 mg/m3 TWA; total inhalable dust, as Mg: 10 mg/m3 TWA

SECTION IX: PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Milky white aqueous slurry; no odor

BOILING POINT (F): 212 F (100 C)	FREEZE POINT (F): Not applicable
pH: ~10 saturated sol	VAP PRESS (mm Hg): Not determined
% VOLATILE (by VOL): 40 - 45%	SPEC GRAV: 1.48 to 1.62
VAPOR DENSITY: Not applicable	EVAPOR RATE: Not applicable
SOLUBILITY IN WATER: Slightly soluble	ODOR THRESH (ppm): Not determined
PHYSICAL STATE: Aqueous slurry	OIL/WATER COEFFIC: Not applicable

SECTION X: STABILITY & REACTIVITY

STABLE: Yes
CONDITIONS OF REACTIVITY: Will react with incompatibles (see below)
CONDITIONS OF CHEMICAL INSTABILITY: Stable under ambient temperatures and pressures.

INCOMPATIBILITY (MATERIALS TO AVOID): ACID (Strong) - vigorous reaction, heat generated; ALUMINUM POWDER - may ignite/explode when heated; BROMINE PENTAFLUORIDE - violent reaction; CHLORINE TRIFLUORIDE - may ignite; INTERHALOGENS - may ignite; MAGNESIUM POWDER - may ignite/explode when heated; OXIDIZERS (Strong) - violent reaction; PHOSPHORUS PENTACHLORIDE - incandesces brilliantly on heating;

HAZARDOUS DECOMPOSITION PRODUCTS: Steam, acrid smoke and trace amounts of carbon dioxide, carbon monoxide and nitrous oxides. If magnesium hydroxide is heated to the point of volatilization (i.e., >1700°C), magnesium oxide FUMES may be generated.

IS THIS PRODUCT SUBJECT TO POLYMERIZATION? No
CONDITIONS UNDER WHICH PRODUCT WILL POLYMERIZE: None known.

SECTION XI: TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY - SKIN CONTACT: Yes SKIN ABSORPTION: No
EYE CONTACT: Yes INHALATION: Yes INGESTION: Yes

NAME OF TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known.

IRRITANCY OF PRODUCT: No data available.

REPRODUCTIVE TOXIN? No *TERATOGEN?* No *MUTAGEN?* No *SENSITIZER?* No

CONSIDERED CARCINOGENIC BY - *NTP?* No *IARC?* No *OSHA?* No

SECTION XII: ECOLOGICAL INFORMATION

LC50 of 284 to 285 mg/L for daphnia (D. magna) -- 48 hour
LC50 of 319 to 511 mg/L for fathead minnow (P. promelas) -- 96 hour
LC50 of 1293 to 1517 mg/L for rainbow trout -- 96 hour

SECTION XIII: DISPOSAL CONSIDERATIONS

Dispose according to local, state/provincial and federal regulations.

If discarded in its purchased form, this product would not be hazardous waste either by listing or by characteristic. *However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)*

SECTION XIIII: TRANSPORT INFORMATION

DOT SHIPPING NAME: Not regulated under DOT *DOT CLASS:* Not applicable

SPECIAL SHIPPING INFORMATION: No special precautions. For further information, refer to –

- Handling & Storage (Section VII)
- Stability & Reactivity (Section X)

SECTION XV: REGULATORY INFORMATION

All of the ingredient(s) contained in this product are included on the following inventory and/or regulatory lists:

Australian Inventory of Chemical Substances (ACIS): Magnesium hydroxide (1309-42-8)

Canada - Domestic Substance List (DSL): Magnesium hydroxide (1309-42-8)

Canada - WHMIS: Ingredient Disclosure List - Magnesium hydroxide (Not listed)

European Inventory of Existing Commercial Chemical Substances (EINECS): Magnesium hydroxide (215-170-3)

Japan - Existing and New Chemical Substances (ENCS) - Magnesium hydroxide (1-386)

Korea - Existing and Evaluated Chemical Substances (KECL) - Magnesium hydroxide (KE-22716)

Philippines Inventory of Chemicals and Chemical Substances (PICCS) - Magnesium hydroxide (present)

Swiss Giftliste 1 (List of Toxic Substances 1), 31 May 1999 - Magnesium hydroxide (G-8166) Toxic Category 4: Acute oral lethal dose of 500 - 2000 mg/kg.

U.S. Toxic Substances Control Act (TSCA) 8(b)Inventory List: Magnesium hydroxide (1309-42-8)

US REPORTING REQUIREMENTS:

CERCLA Hazardous Substance: No

SARA Title III:

Section 311/312 - Categories: Magnesium hydroxide - Acute hazard (nuisance dust if allowed to dry out)

Section 312 - Inventory Reporting: Although not specifically listed, magnesium hydroxide does meet the definition of a hazardous material under OSHA's Hazard Communication Standard at 29 CFR 1910.1200, and therefore is subject to Tier I and/or Tier II annual inventory reporting.

Section 313 - Emission Reporting - This notification must not be detached from this MSDS and any copying and redistribution of this MSDS must include this notice, as required by 40 CFR part 372:

Magnesium hydroxide is not subject to Form R reporting requirements.

Section 302 - Extremely Hazardous Substances: Magnesium hydroxide is not listed.

US CLEAN AIR ACT:

This product complies in all respects to the requirements of Section 611 of Title VI (Stratospheric Ozone Depletion) of the Clean Air Act as amended 1990; namely, that the product neither contains, nor is "manufactured with" (as defined by U.S. EPA) any Class I or Class II Ozone Depleting Substances listed in Title VI, and therefore is not required to carry the warning stated as dictated in the amended Act.

US FEDERAL FOOD, DRUG AND COSMETIC ACT (FFDCA):

21 CFR 184.1428 DIRECT FOOD SUBSTANCES AFFIRMED AS GENERALLY RECOGNIZED AS SAFE, Listing of Specific Substances Affirmed as GRAS: Magnesium Hydroxide

21 CFR 582.1428 SUBSTANCES GENERALLY RECOGNIZED AS SAFE, General Purpose Food Additives: Magnesium Hydroxide

FDA Priority-Based Assessment of Food Additives - Priority-Based Assessment of Food Additives (PAFA) File, FDA Center for Food Safety and Applied Nutrition (CFSAN) (1998) Listed Name(s): Magnesium hydroxide

STATE LISTS -- Magnesium Hydroxide is *NOT* listed on any of the following state lists:

California - Directors List of Hazardous Substances (8 CCR 339)
Florida Hazardous Substance List
Illinois Right-to-Know Toxic Substances List
Massachusetts Right To Know List
Minnesota Hazardous Substance List
NJ Department of Health RTK List
Pennsylvania Right to Know List
Rhode Island Hazardous Substance List

INTERNATIONAL REGULATORY INFORMATION:

EU DIRECTIVES:

- Dangerous Substance Directive 67\548.
- Dangerous Preparations Directive 88\379.

APPROVED CODE OF PRACTICE: Classification and Labelling of Substances and Preparations Dangerous for Supply.

SECTION XVI: OTHER INFORMATION

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0 Other: <blank>
HMIS Ratings: Health: 1 Flammability: 0 Reactivity: 0 PPE: J

SAFETY & RISK PHRASES:

R 20/22	Harmful By Inhalation And If Swallowed.
R 36/37/38	Irritating To Eyes, Respiratory System And Skin.
S 26	In Case Of Contact With Eyes, Rinse Immediately With Plenty Of Water and Seek Medical Advice.
S 36	Wear Suitable Protective Clothing.
S 39	Wear Eye/Face Protection.

SOURCES USED: ACGIH 2000; RTECS June 1998; Sax – 8th Ed.; Ind. Exposure & Control Techn. for OSHA Regulated Substances – MgO (fume), March, 1989, pp. 1181-1184; NIOSH Occupational Health Guide for Chemical Substances – Vol. II, September, 1978.

Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Release: 1.0

Date / Revised: 02-26-2007

Product: ZETAG 8180

NFPA Hazard codes:

Health: 2 Fire: 1 Reactivity: 0 Special: -

HMIS III rating

Health: 2 Flammability: 1 Physical hazard: 0 Personal protection: X

HMIS Note: * Indicates possible chronic health effects.

1. Identification of the substance/preparation and of the Company/Undertaking

Company Information

Company: Ciba Specialty Chemicals Corporation
2301 Wilroy Road
P.O.Box 820
Suffolk,VA 23434-0820
U.S.A.
Customer Service / Product Information: 1-800-322-3885
MSDS Request Line: 1-800-431-2360

Emergency Information

Emergency 24-Hour Health/Environmental Phone: (24h) +1-800-873-1138

CHEMTREC: (800) 424-9300 (24hrs) or (703) 527-3887

Product Information

Product: ZETAG 8180

Use: flocculation agent

2. Hazards identification

Emergency overview

Signal word: CAUTION: !

Colour: off-white

Appearance: powder

State of matter: solid

Odour: odourless

Health: This product is an eye, skin and respiratory irritant

Physical/Chemical hazards: Slip hazard when wet., Refer to MSDS Section 7 for Dust Explosion information.

Potential health effects

Primary routes of entry:

Eyes, Skin, Inhalation, Ingestion

3. Composition/information on ingredients

Chemical name	CAS Number	Content (Weight)	Hazardous
Ethanaminium, N,N,N-trimethyl-2-[(1-oxo-2-propenyl)oxy]-, chloride, polymer with 2-propenamide (9CI)	69418-26-4	85.0 - 95.0 %	Y
Hexanedioic acid-	124-04-9	1.0 - 5.0 %	Y

This material is classified as hazardous under OSHA regulations.

Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Release: 1.0

Date / Revised: 02-26-2007

Product: ZETAG 8180

4. First-aid Measures

Inhalation:

Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult, give oxygen and get immediate medical attention.

Skin:

After contact with skin, wash immediately with plenty of water and soap.
If clothing is contaminated, remove and launder before reuse.
Get medical attention if irritation occurs.

Eyes:

Immediately flush the eye(s) with lukewarm, gently flowing water for 15 minutes or until the chemical is removed.
Get immediate medical attention if irritation persists.

Ingestion:

Do not induce vomiting. If vomiting occurs naturally, have casualty lean forward to reduce the risk of aspiration.
Seek medical attention immediately.

5. Firefighting Measures

Suitable extinguishing media:

carbon dioxide, dry powder, foam, water fog

Unsuitable Extinguishing Media:

If water is used, restrict pedestrian and vehicular traffic in areas where slip hazard may exist.

Hazardous combustion products:

Carbon oxides

Hazards during fire-fighting:

Standard procedure for chemical fires.
The product can form an explosive dust/air mixture. For further information, see Section 7 Explosion Hazards.
The product is slippery when wet.
Restrict pedestrian and vehicular traffic in areas where slip hazard may exist.

Protective equipment for fire-fighting:

Wear self-contained breathing apparatus and chemical-protective clothing.

6. Accidental Release Measures

Cleanup:

Clean up promptly.
Product becomes slippery and difficult to handle when wet.
Wear suitable protective equipment.
Avoid raising dust.
Sweep up and shovel into suitable containers for disposal.
Should not be released into the environment.

7. Handling and Storage

Handling

General advice:

As with all industrial chemicals, use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale. Do not taste or swallow. Use only with adequate ventilation. Slip hazard when wet. Clean up spills promptly

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Ciba

Release: 1.0

Date / Revised: 02-28-2007

Product: ZETAG 8180

Protection against fire and explosion:

Combustible powder. Avoid creating dusty conditions. - Grounding is required when emptying into a conductive container. - When flammable solvents are present, the container must be inerted or the system otherwise designed to prevent or contain an explosion. Seek expert advice. In addition, for products packaged in fused-lined (coated) fiberdrums, fiber drums with conductive liners, steel drums, steel pails, andType " C " FIBC (bulk bags), or other conductive the following instructions also apply: - Always ground this package before emptying. The user is responsible for designing the system to handle solid and ensuring proper training of employees in the system's use.

Storage

General advice:

Keep container tightly closed in a dry, cool and well-ventilated place.

> for industrial use only <

8. Exposure Controls and Personal Protection

Exposure Guidelines

Hexanedioic-acid- (124-04-9)	ACGIH	TWA value: 5 mg/m3

Engineering Controls:

Work in well ventilated areas. Do not breathe dust.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified respirator as necessary.

Eye protection:

Tightly fitting safety goggles (chemical goggles).

Body protection:

Wear chemical resistant gloves and protective clothing.

General safety and hygiene measures:

Eye wash station and safety shower should be available in immediate work area., Select additional protective equipment based upon potential for exposure.

9. Physical and Chemical Properties

Colour:	off-white	
Form:	powder	
State of matter:	solid	
Odour:	odourless	
pH value:		Not tested
Evaporation rate:		Not tested
Lower explosion limit:		Not applicable
Upper explosion limit:		Not applicable
Flash point:		Not applicable
Melting point:		Not applicable
Boiling point:		Not applicable
Vapour pressure:		Not tested
Density:		Not applicable
Bulk density:	0.7 g/cm3	
Vapour density:		Not tested
Partitioning coefficient n-octanol/water (log Pow):		Not applicable
Viscosity, dynamic:		Not tested

Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Release: 1.0

Date / Revised: 02-26-2007

Product: ZETAG 8180

% Volatiles:	not determined
Solubility in water:	soluble
Solubility in other solvents:	Not tested

10. Stability and Reactivity

Stability:
Stable.

Conditions to avoid: Avoid electro-static discharge. Avoid sources of ignition. Avoid humidity. Avoid temperature extremes.

Substances to avoid: Strong oxidizing agents, strong acids, strong bases.

Possibility of Hazardous Reactions: No hazardous reactions known.

Hazardous decomposition products: No decomposition expected under normal storage conditions.

11. Toxicological Information

Acute oral toxicity:
LD50 / oral / rat: > 2,000 mg/kg

Acute inhalation toxicity:
Not determined.

Acute dermal toxicity:
dermal:
Not determined.

Skin irritation:
not determined

Eye irritation:
Component(s) in greater than 1 percent concentration is known to be anirritant.

Information on: Hexanedioic-acid-
(Rabbits) Severe irritant.

Skin Sensitization:
not determined

Chronic toxicity:
not determined

Subacute Toxicity:
not determined

Subchronic Toxicity:
not determined

Genetic toxicity:
Not determined.

Carcinogenicity:
None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.

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Ciba

Release: 1.0

Date / Revised: 02-28-2007

Product: ZETAG 8180

Reproductive toxicity:
not determined

Developmental toxicity/teratogenicity:
not determined

12. Ecological information

Toxicity to fish:
96 h/LC50: 1 - 10 mg/l

Toxicity to aquatic invertebrates:
48 h/EC50: 10 - 100 mg/l

Toxicity to aquatic plants:
72 h/EC50: 1 - 10 mg/l

Toxicity to microorganisms:

Not tested

Biodegradation:
Not tested

Bioaccumulation:

Considered to be zero due to charge and high molecular weight

13. Disposal Considerations

Waste disposal of substance:
Dispose of in accordance with national, state and local regulations.

Resource Conservation and Recovery Act (RCRA): Not a hazardous waste under RCRA (40 CFR 261).

14. Transport information

U.S. Department of Transportation

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

Road transport:
Special shipping information: Not classified as a dangerous good under transport regulations.

Air transport:
Special shipping information: Not classified as a dangerous good under transport regulations.

Inland-waterway transport:
Special shipping information: Not classified as a dangerous good under transport regulations.

15. Regulatory information

Canada: Domestic Substances List (DSL): All components either exempt or listed on the DSL

US: Toxic Substances Control Act (TSCA): All component(s) comprising this product are either exempt or listed on the TSCA inventory

Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Release: 1.0

Date / Revised: 02-28-2007

Product: ZETAG 8180

United States - Regulations

SARA Section 311/312 Hazard Communication Standard:

Acute Health:	Y	Fire:	N
Chronic Health:	N	Reactivity:	N
		Sudden release of pressure:	N

SARA Section 313 Toxic Chemical List:

This product does not contain any components reportable under Sec 313 (40 CFR 372).

OSHA hazard category:

This material is classified as hazardous under OSHA regulations.

Toxic Substances Control Act (TSCA) Significant New Use Rule (SNUR):

This product is not subject to a Significant New Use Rule (SNUR).

Toxic Substances Control Act (TSCA) Section 5(e) Consent Orders:

This product is not subject to a Section 5(e) Consent Order.

Toxic Substances Control Act (TSCA) Section 5(f):

This product is not subject to a Section 5(f)/6(a) rule.

Toxic Substances Control Act (TSCA) Section 12(b) Export Notification:

No components listed.

Clean Air Act - Hazardous Air Pollutants (HAP):

Chemical name	CAS Number	Notification
2-Propenamide	79-06-1	Listed

Clean Air Act 111 - Volatile Organic Compounds (VOC):

Chemical name	CAS Number	Notification
2-Propenamide	79-06-1	Listed
Hexanedioic-acid-	124-04-9	Listed

Clean Air Act 602 - Ozone Depleting Substances (ODS):

This product neither contains, nor was manufactured with, a Class I or Class II ozone depleting substance (ODS), as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App. A+B).

Clean Water Act - Priority Pollutants (PP):

This product does not contain any priority pollutants listed under the U.S. Clean Water Act Section 307(2)(1) Priority Pollutant List (40 CFR 401.15).

Pennsylvania Right to Know:

Chemical name	CAS Number	Notification
2-Propenamide	79-06-1	Environmental hazard.
2-Propenamide	79-06-1	Listed
Hexanedioic-acid-	124-04-9	Environmental hazard.
Hexanedioic-acid-	124-04-9	Listed

California Proposition 65 - Chemicals Known to the State to Cause Cancer:

Chemical name	CAS Number	Notification
2-Propenamide	79-06-1	Carcinogenic.

WARNING: This product contains a chemical known to the State of California to cause cancer.

International Regulations

Chemical Weapons Convention:

This product does not contain any component(s) listed under the Chemical Weapons Convention Schedule of Chemicals.

Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Release: 1.0

Date / Revised: 02-28-2007

Product: ZETAG 8180

16. Other information

Disclaimer:

The information contained herein is based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to such data or information. The user is responsible for determining whether the product is suitable for its intended conditions of use.

END OF DATA SHEET

Material Safety Data Sheet

LA2764
Sodium Hypochlorite 12%

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA2764
Product Name: Sodium Hypochlorite 12%
Synonyms: Sodium oxychloride; Soda bleach liquor; Javel water; Clorox; Javex.
Chemical Family: Hydrochlorous acid, sodium salt.
Application: Chemical intermediate. Laboratory reagent. Water treatment. Pulp and paper. Bleaching agent. Disinfectant.

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: 25 February 2008
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:
Water 7732-18-5	Balance	Oral LD50 (Rat) >90 mL/kg
Sodium Hypochlorite, Solution 7681-52-9	12-14	Oral LD50 (Rat) 8200 mg/kg Dermal LD50 (Rabbit) 10000 mg/kg

Note: Drug Identification Number (DIN) - 02265729

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: Corrosive to eye tissue and may cause severe damage and blindness.
Skin Contact: Corrosive. May cause severe skin irritation. Prolonged contact may lead to burns and blisters and may aggravate dermatitis. May cause whitening or bleaching of the skin.
Inhalation: Corrosive to the respiratory passage. Causes irritation of the mouth, nose and throat. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary edema (fluid build-up in lungs) and reduction of pulmonary function. If mixed with acids or warmed to temperatures greater than 40 degrees Celcius, Sodium hypochlorite solutions release chlorine gas. This gas can cause severe irritation of the nose and throat. Exposures to high levels of chlorine gas may result in severe lung damage.

3. HAZARDS IDENTIFICATION

Ingestion: Corrosive. Causes burns to the mouth, throat and stomach. Causes vomiting, nausea, and diarrhea. Coma, shock and death may occur.

4. FIRST AID MEASURES

Eye Contact: Wash eyes with water for a minimum of 30 minutes or until no evidence of the chemical remains. Hold eyelids open during flushing. Seek immediate medical attention.
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 30 minutes. Get medical attention.
Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Ingestion: Rinse mouth with water. Do not induce vomiting. Do not give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Seek immediate medical attention.
Notes to Physician: 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.

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: Keep containers cool to prevent rupture and release of material. Closed containers may explode in fire. Spilled material may cause floors and contact surfaces to become slippery.
Hazardous Decomposition/Combustion Materials (under fire conditions): Chlorine. Oxygen. Oxides of sodium.
Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.
NFPA RATINGS FOR THIS PRODUCT ARE: Not Available.
HMIS RATINGS FOR THIS PRODUCT ARE: Not Available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed. Consult local authorities.
Procedure for Clean Up: Ventilate area. Small spills: soak up with absorbent material and scoop into containers. Large spills : prevent contamination of waterways. Dike and pump into suitable containers. Clean up residual with absorbent material, place in appropriate container and flush with water. Spilled material may cause floors and contact surfaces to become slippery.

7. HANDLING AND STORAGE

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. When diluting, add this product to water in small amounts to avoid spattering. Never add water to this material.
Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Store below 29 °C. Do not freeze. Keep away from direct sunlight. Store away from organic chemicals, strong bases, metal powders, carbides, sulfides, and any readily oxidizable material. Storage area should be equipped with corrosion-resistant floors, sumps and should have controlled drainage to a recovery tank. Store in a sealed polyethylene lined container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Local exhaust ventilation as necessary to maintain exposures to within applicable limits. Make up air should always be supplied to balance air exhausted (either generally or locally). Ventilation required when spraying or applying in a confined area. Ventilation should be explosion proof. Eliminate ignition sources.

Respiratory Protection: Wear a Niosh approved full facepiece respirator for acid gases or a self-contained breathing apparatus for air concentration levels up to 5 ppm. NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Gloves:

Impervious gloves. Neoprene gloves. Nitrile gloves. Rubber gloves.

Skin Protection: Neoprene coated apron or chemical resistant clothing. Impervious boots.

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

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

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Water	Not available.	Not available.	Not Available.
Sodium Hypochlorite, Solution	0.5 ppm As For Chlorine.	Not available.	Not Available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.
Colour: Clear Green to yellow.
Odour: Chlorine.
pH 11.5 - 13
Specific Gravity: 1.21
Boiling Point: Decomposition at 40 °C / 104 °F
Freezing/Melting Point: -25 °C / -12 °F
Vapour Pressure: 17.5 mmHg
Vapour Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: Not Available.
Solubility: Miscible in water.
VOCs: Not Available.
Viscosity: Not Available.
Molecular Weight: Not Available.
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Unstable above 40°C / 104 °F.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: High temperatures. Exposure to light.
Materials to Avoid: Acids. Ammonia. Strong oxidizers. Reducing agents. Metals.
Hazardous Decomposition Products: When heated to decomposition, it emits acrid smoke and irritating fumes. Chlorine. Oxides of sodium. Oxygen.

Additional Information:

Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Hypochlorite bleach reacts with urea to form nitrogen trichloride whic explodes spontaneously in air. Some metals accelarate the decomposition of Sodium Hypochlorite. Nickel. Copper. Tin. Iron and its alloys. Manganese.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: Corrosive. Causes burns to the mouth, throat and stomach. Causes vomiting, nausea, and diarrhea. Coma, shock and death may occur.

11. TOXICOLOGICAL INFORMATION

Skin Contact: Corrosive. May cause severe skin irritation. Prolonged contact may lead to burns and blisters and may aggravate dermatitis. May cause whitening or bleaching of the skin.
Inhalation: Corrosive to the respiratory passage. Causes irritation of the mouth, nose and throat. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary edema (fluid build-up in lungs) and reduction of pulmonary function. If mixed with acids or warmed to temperatures greater than 40 degrees Celcius, Sodium hypochlorite solutions release chlorine gas. This gas can cause severe irritation of the nose and throat. Exposures to high levels of chlorine gas may result in severe lung damage.
Eye Contact: Corrosive to eye tissue and may cause severe damage and blindness.

Additional Information: Aspiration may cause lung damage. Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain.
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
Water	Not listed.	Not listed.
Sodium Hypochlorite, Solution	Group 3	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
Water	Not Available.	Not Available.	Not Available.
Sodium Hypochlorite, Solution	LC50 (Pimephales promelas) 0.22 - 0.62 mg/L LC50 (Pimephales promelas) 5.9 mg/L	Not Available.	EC50 (Skeletonema costatum) 0.095 mg/L

Other Information:
Harmful to aquatic life at low concentrations. Toxicity is primarily associated with pH.

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: HYPOCHLORITE SOLUTION
DOT Hazardous Class 8
DOT UN Number: UN1791
DOT Packing Group: III
DOT Reportable Quantity (lbs): Not Available.
Note: No additional remark.
Marine Pollutant: No.

14. TRANSPORT INFORMATION

TDG (Canada):
TDG Proper Shipping Name: HYPOCHLORITE SOLUTION
Hazard Class: 8
UN Number: UN1791
Packing Group: III
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:
Water	Not Listed.	Not Listed.	Not Listed.
Sodium Hypochlorite, Solution	Not Listed.	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:
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:
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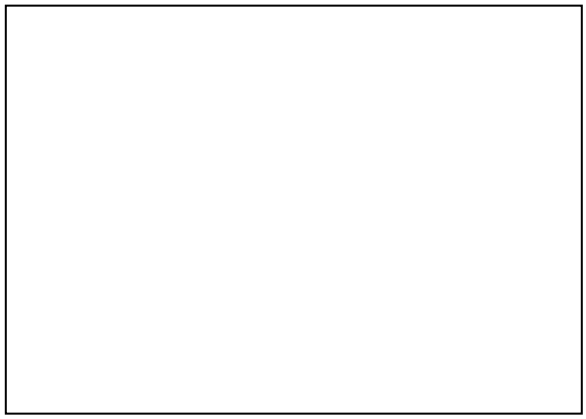
Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar Sales Office.

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*****

Canada Sugar

Canada Sugar ™ Fine Granulated Sugar



PRODUCT DESCRIPTION

Canada Sugar™ Fine Granulated Sugar is a fine, general purpose cane sugar with a sparkling white, uniform crystal. It can be used as a bulking agent, sweetener, carrier or flavor enhancer in a variety of food and beverage applications. Canada Sugar™ Fine Granulated Sugar is carefully processed in accordance with good manufacturing practice under strict quality control and sanitary conditions.

INGREDIENT DECLARATION

Cane Sugar

STORAGE GUIDELINES

Store at ambient temperature between 16 - 21ºC and 40 – 50% relative humidity (RH) Wide variations in temperature and humidity can cause caking. Storage area should be clean and free of odours.

SHELF LIFE

Indefinite under proper storage conditions. One year for inventory rotation purposes.

KOSHER STATUS: COR 364

Canada Sugar

Canada Sugar™ Fine Granulated Sugar

PACK SIZES/PALLETIZATION

PACK SIZE	PRODUCT CODES	PALLETIZATION
20 Kg Bag	#1100	56 bags per skid (7 bags per row X 8 rows high)
40 Kg Bag	#1200	30bags per skid (5 bags per row X 6 rows high)
1000 Kg Tote	#1300	1 tote per skid

Chemical Characteristics

Polarization	98.87
Ash	0.015% max.
Moisture	0.04% max.
Invert	0.025% max.
Colour	35 max.

Granulation Size

On #20 US	2% max
On #30 US	20% max
On #40 US	45% min
Thru # 70 US	10% max

Canada Sugar

Canada Sugar™ Fine Granulated Sugar

Nutritional Information

Nutritional Profile (by calculation)

Nutrition Facts
Valeur nutritive
Per 100 g / par 100 g

	Amount / Teneur
Calories/Calories	385
Fat/Lipides	0 g
Carbohydrate/Glucides	99.95 g
Sugars / Sucres	99.95 g
Protein / Protéines	0 g

Not a significant source of saturated fat, trans fat, cholesterol, sodium, fibre, vitamin A, vitamin C, calcium or iron.

Source négligeable de lipides saturés, lipides trans, cholestérol, sodium, fibres, vitamine A, vitamine C, calcium et fer.

Canada Sugar

Canada Sugar™ Fine Granulated Sugar
Nutritional Information

Nutritional Profile (by calculation)

Nutrition Facts
Valeur nutritive
Per 1 teaspoon (4 g)
par 1 cuillère à thé

Amount Teneur	% Daily Value % valeur quotidienne
Calories/Calories	15
Fat/Lipides	0 g 0%
Carbohydrate/Glucides	4 g 1%
Sugars/Sucres	4 g
Protein/Protéines	0 g

Not a significant source of saturated fat, trans fat, cholesterol, sodium, fibre, vitamin A, vitamin C, calcium or iron.

Source négligeable de lipides saturés, lipides trans, cholestérol, sodium, fibres, vitamine A, vitamine C, calcium et fer.

Canada Sugar

Canada Sugar™ Fine Granulated Sugar

ALLERGEN AND FOOD SENSITIVITY CHART *

Please indicate with a **YES (√) or NO (X),** which items and/or their derivatives are present. If none are present, please indicate NO in the spaces provided. DO NOT LEAVE EMPTY SPACES.

Component	Present in the product	Present in other products manufactured on the same line	Present in the same manufacturing plant in a segregated area
Peanuts (and derivatives i.e. peanut oil)	X	X	X
Tree Nuts (and derivatives)	X	X	X
Sesame Seeds (and derivatives)	X	X	X
Dairy Products (i.e. Milk, Lactose, Caseinates, Whey)	X	X	X
Eggs	X	X	X
Fish	X	X	X
Shellfish	X	X	X
Soy Products	X	X	X
Wheat	X	X	√
Sulphites	X	X	√

Additional Ingredients of Consumer Concern:

Gluten	X	X	√
Tartrazine	X	X	X
Hydrolyzed Protein	X	X	X
Lecithin	X	X	X
Genetically Modified Ingredients	X	X	X
Corn	X	X	√
Aspartame	X	X	X
Monosodium Glutamate	X	X	X