SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Substance
Product Name: Sodium Chlorate
Synonyms: Chlorate of soda; Chloric acid, sodium salt, Sodium Chlorate Crystal

Intended Use of the Product
Production of Chlorine dioxide for bleaching pulp; Herbicide

Name, Address, and Telephone of the Responsible Party

Manufacturer
CHEMTRADE LOGISTICS INC.
155 Gordon Baker Road
Suite 300
Toronto, Ontario M2H 3N5
For SDS Info: (416) 496-5856
www.chemtradelogistics.com

Emergency Telephone Number
Emergency Number : Canada: CANUTEC +1-613-996-6666 / US: CHEMTREC +1-800-424-9300
INTERNATIONAL: +1-703-741-5970
Chemtrade Emergency Contact: (866) 416-4404
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS Classification
Ox. Sol. 1 H271
Acute Tox. 4 (Oral) H302
Aquatic Chronic 2 H411

Full text of hazard classes and H-statements : see section 16

Label Elements

GHS Labeling

Hazard Pictograms :

Signal Word : Danger

Hazard Statements :
H271 – May cause fire or explosion; strong oxidizer.
H302 - Harmful if swallowed.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary Statements :
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 - Keep away from clothing and other combustible materials.
P221 – Take any precaution to avoid mixing with combustibles and other incompatible materials
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P312+P330 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth.
Sodium Chlorate
Safety Data Sheet

P371+P380+P375 - In case of major fire and large quantities: Evacuate area. Fight fire remotely due to high risk of explosion.
P306+P360 – IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P391 - Collect spillage.
P420 Store away from incompatible materials
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Other Hazards
Exposure may aggravate pre-existing eye, skin, or respiratory conditions. Overexposure may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

Thermally unstable at elevated temperatures. (>265°C)

Unknown acute toxicity
No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance</th>
<th>Product Identifier</th>
<th>%*</th>
<th>GHS Ingredient Classification</th>
</tr>
</thead>
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<tr>
<td>Sodium chlorate</td>
<td>(CAS-No.) 7775-09-9</td>
<td>&gt; 99.6</td>
<td>Ox. Sol. 1, H271 Acute Tox. 4 (Oral), H302 Aquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>

Full text of H-phanes: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

SECTION 4: FIRST AID MEASURES

Description of First-aid Measures
General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Get medical advice/attention. Wash clothing before storing or reuse. Clean shoes thoroughly before reuse.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

Most Important Symptoms and Effects both Acute and Delayed
General: Harmful if swallowed. Overexposure to this material may result in methemoglobinemia. Methemoglobinemia decreases the blood’s ability to carry oxygen and results in symptoms such as dizziness, drowsiness, headache, shortness of breath, blue skin and lips, rapid heart rate, unconsciousness, and possibly death.

Inhalation: Prolonged exposure may cause irritation.

Skin Contact: Prolonged exposure may cause skin irritation.

Eye Contact: May cause slight irritation to eyes.

Ingestion: Ingestion may cause adverse effects. Overexposure may result in hemolytic and renal toxicity.

Chronic Symptoms: None expected under normal conditions of use. Overexposure to this material may result in methemoglobinemia.

Indication of Any Immediate Medical Attention and Special Treatment Needed
If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.
SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Water. Use water spray or fog.

Unsuitable Extinguishing Media: Do not use dry extinguishing powder. Foam. Carbon dioxide (CO2). Do not use fire blanket.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: May cause fire or explosion; strong oxidizer.

Explosion Hazard: Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: Oxidizer: increases the burning rate of combustible materials.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Irritating or toxic vapors. Halogenated compounds, metal oxide/oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking, flames, hot surfaces, sparks, or other ignition sources in the area. Avoid prolonged contact with eyes, skin and clothing. Avoid breathing dust. Keep away from combustible material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).


For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

Methods and Materials for Containment and Cleaning Up

For Containment: Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. Use only non-sparking tools.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Do not take up in combustible material such as: saw dust or cellulosic material.

Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Avoid breathing dust. Keep away from heat, sparks, open flames, hot surfaces, combustible materials, incompatible materials. - No smoking.

Additional Hazards When Processed: May cause fire or explosion; strong oxidizer.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.
Sodium Chlorate
Safety Data Sheet

**Storage Conditions**: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from extremely high or low temperatures, incompatible materials, food and drink. Keep in fireproof place. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.


**Specific End Use(s)**
Mainly used in the on-site production of chlorine dioxide for bleaching pulp. Also, used in the manufacture of dyes, explosives & matches, perchlorate manufacturing, ore processing, leather tanning and finishing, production of oxygen in rescue breathing apparatus, as an oxidizing agent, analytical reagent and herbicide.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control Parameters**
For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

**Exposure Controls**
**Appropriate Engineering Controls**: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Proper grounding procedures to avoid static electricity should be followed.

**Personal Protective Equipment**: Gloves. Protective clothing. Protective goggles or safety glasses.

**Materials for Protective Clothing**: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

**Hand Protection**: Wear protective gloves.

**Eye Protection**: Chemical safety goggles or safety glasses.

**Skin and Body Protection**: Wear suitable protective clothing.

**Respiratory Protection**: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

**Other Information**: When using, do not eat, drink or smoke.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Information on Basic Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical State</strong></td>
<td>Solid</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Colorless or white crystals</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Odorless</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>7 - 9 (Neutral as solution in water)</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Melting Point</strong></td>
<td>248 °C (478.4 °F)</td>
</tr>
<tr>
<td><strong>Freezing Point</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Boiling Point</strong></td>
<td>265 °C (509 °F) decomposes</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Auto-ignition Temperature</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Decomposition Temperature</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Lower Flammable Limit</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Upper Flammable Limit</strong></td>
<td>Not available</td>
</tr>
</tbody>
</table>
Sodium Chlorate
Safety Data Sheet

**SECTION 10: STABILITY AND REACTIVITY**

Reactivity: Oxidizer: increases the burning rate of combustible materials.

Chemical Stability: May cause fire or explosion; strong oxidizer.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Extremely high or low temperatures, ignition sources, combustible materials, incompatible materials.

Incompatible Materials: Strong acids. Reducing agents. Organic materials. Mixture with flammable or combustible materials may ignite readily or explode and be sensitive to shock, heat, or friction. Mixtures of dry sodium chlorate with organic materials such as cloth, paper, leather, oils, greases, paints, and solvents may be readily ignited by heat or friction. Reacts violently with combustibles, sulfuric acid, and reducing materials. Explosions may be caused by contact with ammonia salts, ammonium thiosulfate, antimony sulfide, arsenic, carbon, charcoal, organic matter, organic acids, thiocyanates, chemically active metals, oils, metal sulfides, nitrobenzene, powdered metals, and sugar. Reacts with many organic materials to form shock-sensitive mixtures, causing explosion hazard.

Hazardous Decomposition Products: None expected under normal conditions of use. Decomposes at 265°C into oxygen and salt. Reacts with acids to produce chlorine, chlorine dioxide and perchloric acid.

**SECTION 11: TOXICOLOGICAL INFORMATION**

Information on Toxicological Effects - Product

Acute Toxicity (Oral): Oral: Harmful if swallowed.

Acute Toxicity (Dermal): Not classified

Acute Toxicity (Inhalation): Not classified

LD50 and LC50 Data:

| Sodium Chlorate Crystal (7775-09-9) | ATE (Oral) | 1,204.82 mg/kg body weight |

Skin Corrosion/Irritation: Not classified

pH: 7 - 9 (Neutral as solution in water) Oxidizing activity increases with decreasing pH.

Eye Damage/Irritation: Not classified

pH: 7 - 9 (Neutral as solution in water) Oxidizing activity increases with decreasing pH.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Effects After Inhalation: Prolonged exposure may cause irritation. Cyanosis may be noted within several hours following inhalation or ingestion.

Symptoms/Effects After Skin Contact: Prolonged exposure may cause skin irritation. Symptoms may include redness, drying, defatting and cracking of the skin.

Symptoms/Effects After Eye Contact: May cause slight irritation to eyes.

Symptoms/Effects After Ingestion: Ingestion may cause adverse effects. Overexposure may result in hemolytic and renal toxicity. Ingesting large quantities can cause abdominal pain, nausea, and diarrhea, possibly with dark blood, cyanosis, possibly progressing to headache, difficulty breathing, dizziness, seizures, or coma. Symptoms may include redness and edema.

Chronic Symptoms: None expected under normal conditions of use. Overexposure to this material may result in methemoglobinemia.
Sodium Chlorate
Safety Data Sheet

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

<table>
<thead>
<tr>
<th>Sodium chlorate (7775-09-9)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>LD50 Oral Rat</td>
<td>1200 mg/kg</td>
</tr>
<tr>
<td>LD50 Dermal Rabbit</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>LC50 Inhalation Rat</td>
<td>&gt; 5.59 mg/l (Exposure time: 4.5 h)</td>
</tr>
</tbody>
</table>

Sodium chlorate (7775-09-9)
National Toxicology Program (NTP) Status: Some evidence of carcinogenic activity.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecology - General: Toxic to aquatic life with long lasting effects.

Sodium chlorate (7775-09-9)

<table>
<thead>
<tr>
<th>LC50 Fish 1</th>
<th>13500 mg/l (Exposure time: 96 h - Species: Pimephales promelas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 Fish 2</td>
<td>1750 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)</td>
</tr>
</tbody>
</table>

Persistence and Degradability

Sodium Chlorate Crystal (7775-09-9)
Persistence and Degradability: May cause long-term adverse effects in the environment.

Bioaccumulative Potential

Sodium Chlorate Crystal (7775-09-9)
Bioaccumulative Potential: Not established.

Mobility in Soil: Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

*When shipped in accordance with US DOT 49 CFR part 171.4(c) and other appropriate sections/provisions this material is not designated as a marine pollutant when transported by road or rail.

**When shipped in accordance with the Canada Transport of Dangerous Goods Regulations part 1.45.1 and other appropriate sections/provisions this material is not designated as a marine pollutant when transported by road or rail.

Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Sodium Chlorate

Safety Data Sheet


**TRANSPORTATION CLASSIFICATION**

<table>
<thead>
<tr>
<th>Identification Number</th>
<th>DOT</th>
<th>TDG</th>
<th>IMDG</th>
<th>IATA</th>
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<tr>
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<td><strong>Proper Shipping Name</strong></td>
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<td>SODIUM CHLORATE</td>
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**Packing Group**

| II | II | II | II |

**Environmental Hazards**

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<th>Marine Pollutant</th>
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<tr>
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**Emergency Response**

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<th>ERAP Index</th>
<th>EMS</th>
<th>ERG code (IATA)</th>
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<td>140</td>
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<td>F-H, S-Q</td>
<td>5L</td>
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**Additional Information**

| Not applicable | Not applicable | Not applicable | Not applicable |

**SECTION 15: REGULATORY INFORMATION**

**US Federal Regulations**

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>CERCLA RQ</th>
<th>EPCRA 304 RQ</th>
<th>SARA 302 TPQ</th>
<th>SARA 313</th>
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<td>Not applicable</td>
<td>Not applicable</td>
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</tbody>
</table>

**SARA 311/312**

**Sodium Chlorate Crystal (7775-09-9)**

Fire hazard. Immediate (acute) health hazard

**US TSCA Flags**

Not present

**US State Regulations**

**California Proposition 65**

<table>
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<tr>
<th>Chemical Name (CAS No.)</th>
<th>Carcinogenicity</th>
<th>Developmental Toxicity</th>
<th>Female Reproductive Toxicity</th>
<th>Male Reproductive Toxicity</th>
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<td>No</td>
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</tbody>
</table>

**State Right-To-Know Lists**

**Sodium chlorate (7775-09-9)**

U.S. - Massachusetts - Right To Know List - Yes
U.S. - New Jersey - Right to Know Hazardous Substance List - Yes
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List - No
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances - No
U.S. - Pennsylvania - RTK (Right to Know) List - Yes

**Canadian Regulations**

**Sodium chlorate (7775-09-9)**

Listed on the Canadian DSL (Domestic Substances List)
Not listed on the Canadian NDSL (Non-Domestic Substances List)

**International Inventories/Lists**

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>Australia AICS</th>
<th>Turkey CICR</th>
<th>Korea ECL</th>
<th>EU EINECS</th>
<th>EU ELINCS</th>
<th>EU SVHC</th>
<th>EU NLP</th>
<th>Mexico INSQ</th>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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**Chemical Name (CAS No.)**

<table>
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<th>China IECSC</th>
<th>Japan ENCS</th>
<th>Japan ISHL</th>
<th>Japan PDSCL</th>
<th>Japan PRTR</th>
<th>Philippines PICCS</th>
<th>New Zealand NZIOC</th>
<th>US TSCA</th>
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<tbody>
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<td>Yes</td>
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Sodium Chlorate

Safety Data Sheet

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 11/27/2017

Revision Summary

<table>
<thead>
<tr>
<th>Section</th>
<th>Change</th>
<th>Date Changed</th>
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<tr>
<td>2</td>
<td>Precautionary statements modified</td>
<td>11/27/2017</td>
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<tr>
<td>4</td>
<td>Language modified</td>
<td>11/27/2017</td>
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<td>5</td>
<td>Language modified</td>
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<td>16</td>
<td>Data modified</td>
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Other Information: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR).

GHS Full Text Phrases:

- Acute Tox. 4 (Oral) - Acute toxicity (oral) Category 4
- Aquatic Chronic 2 - Hazardous to the aquatic environment - Chronic Hazard Category 2
- Ox. Sol. 1 - Oxidizing solids Category 1
- H271 - May cause fire or explosion; strong oxidizer
- H302 - Harmful if swallowed
- H411 - Toxic to aquatic life with long lasting effects

NFPA 704
- NFPA Health Hazard : 1
- NFPA Fire Hazard : 0
- NFPA Reactivity Hazard : 3
- NFPA Specific Hazards : OX - Materials that posses oxidizing properties.

HMIS Rating
- Health : 1
- Flammability : 0
- Physical : 3

PPE See Section 8

Abbreviations and Acronyms

AICS – Australian Inventory of Chemical Substances
ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
ATE - Acute Toxicity Estimate
BCF - Bioconcentration factor
BEI - Biological Exposure Indices (BEI)
CAS No. - Chemical Abstracts Service number
CERCLA RQ - Comprehensive Environmental Response, Compensation, and Liability Act - Reportable Quantity
CICR - Turkish Inventory and Control of Chemicals
EC50 - Median effective concentration
ECL - Korea Existing Chemicals List

LCS0 - Median Lethal Concentration
LD50 - Median Lethal Dose
LOAEL - Lowest Observed Adverse Effect Level
LOEC - Lowest-observed-effect Concentration
Log Pow - Octanol/water Partition Coefficient
NOAEL - No-Observed Adverse Effect Level
NOEC - No-Observed Effect Concentration
NIOHC - New Zealand Inventory of Chemicals
OEL - Occupational Exposure Limits
OSHA – Occupational Safety and Health Administration

NLP - Europe No Longer Polymers List
EC50 - Median effective concentration
ECL - Korea Existing Chemicals List
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