Material Safety Data Sheet

1 Product And Company Identification
Product Name: Calcium Hypochlorite, Granular
STAR-CHLON 70G
Manufacturer Name: Nankai Chemical Co., Ltd.
Address: Minami-Horie 1-12-19, Nishi-ku, Osaka, Japan
Tel: +81-6-6532-5693
Department in Charge: Tosa Factory
Product Quality Control & Warranty Group
Tel: +81-88-831-6191
Fax: +81-88-831-3461
Emergency Call: +81-88-831-6191
Reference No.: 218 November 25, 1992 The 1st edition
March 1, 2011 Revision

2 Hazardous & Toxicological Information Classification by GHS
Physical/Chemical Hazard

3 Composition/Information on Ingredients
Product name: Calcium Hypochlorite
Chemical name: Calcium Hypochlorite, Calcium Oxychloride or Chlorinated Lime
Chemical Formula or Structural Formula: Ca(ClO)2
Composition: Available Chlorine 70% Min.
CAS No: 7778-54-3
Chemical Manufacturing and Inspection Act: (1) - 177
Industrial Health and Safety Act: (1) - 177
Existing Chemicals Evaluation Act of Japan: NA
The United Nations Classification: Class 5.1 (Oxidizing Material, Container Grade II)
The UN No.: 3487
4 Hazards Identification

Fire Defense Law of Japan: Hazards Group I

Physical And Chemical Hazards

Danger:
- Direct contact with the substances mentioned below may cause decomposition of material and fire or explosion.
- Fire, heat, acid, alkali, organic solvent, reducing agent and other combustible material like oil&fat, grease.
- Contact with those above may cause degradation of material and fire or explosion.
- Contact with inorganic bleaching powder, ammonia and ammonium salt may generate hazardous and explosive gases.

Potential Health Effects:
- Eye contact may cause irritation and pain burns.
- Skin contact may cause irritation and prolonged contact may cause burns.
- Inhalation may cause irritation, choking and damage to respiratory tract, mucous membranes.
- Ingestion may cause damage to mucous membranes and digestive tract.

Potential Environmental Effects
- Material is believed not to persist in the environment. Hydrolysis reaction occurs in water.

Odor: Chlorine-like odor
Classification: Oxidizing substance

Classification of Danger and Harmfulness

<table>
<thead>
<tr>
<th>Name of Classification</th>
<th>Danger</th>
<th>Harmfulness</th>
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<tbody>
<tr>
<td></td>
<td>They are applicable under the I grade dangerous articles of the Fire Services Act.</td>
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<td>If they are exposed to heat, or touch grease, oil, deoxides, and other flammable materials, they dissolve and they may cause fire or an explosion.</td>
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<td>If they are mixed with organo bleaching powder (chlorinated isocyanuric acid) they produce harmful and explosive gas.</td>
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<td>In case of personal contact, they irritate eyes and roughen skin.</td>
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<td>If swallowed, mucus problems will occur.</td>
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<tr>
<td>Effective environment</td>
<td>They gradually dissolve in water.</td>
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</tbody>
</table>

5 First Aid Measures

Inhalation
- Immediately remove the victim to fresh air or uncontaminated area.
- Call immediately emergency services and medical assistance.

Eye Contact
- Immediately wash thoroughly with running water, eyes and upper/lower lids for at least 15 minutes.
- Immediately get Medical Attention.

Skin Contact
- Immediately remove clothes and/or wash contaminated area with running water.
- Wash contaminated area with soap and running water for at least 15 minutes.
- Immediately get Medical Attention.

Ingestion
- Immediately get Medical Attention.
- When conscious, drink plenty of water or milk and vomit.
- When unconscious, do not force to vomit.
6 Fire Fighting Measures
Fire And Explosion Hazards
Extinguish Media
Large amount of water.
Do not use any dry chemicals, carbon dioxide, halogenated extinguishing agent
In case of fire
Evacuate to the safe areas where supposed locations of upwind and high.
Move container from fire area if safety ensured.
If not, spray large amount of water to cool container to prevent from vapor/rupture.
Spraying water may also help gas/vapor disperse wider.
Extinguishing action
Extreme caution is needed if to do.
Wear thoroughly protective clothing and self-contained breathing apparatus.
Avoid inhalation of material and gas/vapor.
Damp material must be neutralized thoroughly before waste and also contaminated water must be neutralized.

7 Accidental Release Measures
In case of spill
Clean up immediately.
Wear gloves when touch spilled material.
Action to clean up
Wear appropriate protective clothing and equipment.
Keep unnecessary person away.
Do not use water to spilled material.
Scoop spilled material into clean, dry container and sweep spilled area thoroughly.
Extreme care to prevent from any contamination with combustible or organic material.
Do not return spilled material to original container.
Prevent material from get into sewers, waterways and rivers.
Caution to release
Do not damp spilled material.
Damp/wet material must be neutralized thoroughly before release.

8 Handling And Safety
Handling
Wear appropriate protective clothing and equipment.
Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor, hume, dust of material.
Handle container with care not to damage.
Avoid generate mist and dust.
Ensure adequate ventilation.
Prevent from contact with inorganic bleaching powder, ammonia and ammonium salt.
Prevent from any contamination and contact with combustible or organic material.
Prevent from contact with fire, heat, acid, alkali, grease.
Wash thoroughly body and clothing after handling.
Storage
Store in tightly closed container in clean, dry, cool and well-ventilated area.
Do not allow water/humidity get into container.
Prevent from contact with ammonia.
Store away from fire, heat, acid, alkali, grease, oil, deoxides, incompatible material and combustible material.
Isolate from Chlorinated isocyanuric acid.
Recommend to keep container on pallet, in dark place avoiding direct exposure to sunlight.
Keep temperature below 40 °C.
9 Exposure Controls And Personal Protection

Specific control
Implement complete procedure of operation not to accumulate dust.

Not available
Not available

Ventilation
Ensure adequate ventilation.
Install local exhausting ventilator where mist or dust may generated.

Eye Protection
Wear appropriate goggles to prevent eyes from contact with material.
Install for emergency eye wash fountain and drench shower within the immediate work area.

Respiratory
Wear full face protective mask of dust-free or anti halogen-gas
Specific respirator may be used.

Protective tools
Gloves
Wear suitable gloves made of rubber

Clothing
Wear protective clothing to prevent skin contact.

10 Physical And Chemical Properties

Appearance Granular
Color White
Odor Chlorine-like odor
Molecular weight 142.98 g/mol
Boiling point None
Melting point None
Decomposition temperature Approx. 180°C ( by DTA )
Solubility in water Approx. 20 g/100g ( Water ) ( 20°C )
Density 1.1
Bulk density 1.0
Specific gravity (H2O = 1) 2.1
pH 9.4 (100 ppm in water)
Corrosiveness Almost same level as chlorine gas
11 Stability And Reactivity

Stability:
- Stable if dry.
- Hazardous thermal decomposition/combustion:
  - Hazardous when contact with organic materials, deoxides or acid to produce gases of oxygen or chlorine and ignite inflammable material.

Water:
- Contact with water generate heat.
- When wet, dissolve and/or explode with generated heat and/or may cause fire or generate hazardous gases.

Contamination:
- Cause hazardous decomposition.
- Keep away from fire, heat, acid, alkali, grease, oil, deoxides, incompatible material and combustible material.

Reactivity:
- Ignition point: None
- Decomposition temperature: Approx. 180°C (by DTA)
- Oxidation: Corrosive under Rules & Regulations for Dangerous Articles Transportation by sea

12 Toxicological Information

Effects on human

Eyes
- May cause severe irritation to mucous membranes, pain, burns and conjunctivis

Skin
- May cause severe irritation, pain, dermatitis and burns

Inhalation
- May cause severe irritation, choking and damage to respiratory tract, mucous membranes

Harmfulness

Sensibility: No data
Acute Virulence: Rat, 790–1260 mg/Kg(1), 2) orally
Variability: (Ames test) Negative 2)

13 Ecological Information

Ecotoxicity: No Data.

14 Disposal Consideration

Dispose in accordance with all applicable regulations.

Caution to dispose

1. Do not dispose in trash or waste bin.
2. Do not dispose together with organic materials including chlorinated isocyanuric acid.
3. Do not dispose any leaked or waste of the product without appropriate treatment.
   or
4. Dispose after dissolving the product in large amount of water and treat with deoxidizing chemicals such as Hypo (Sodium thiosulfate), Sodium sulfite, Sodium sulfide and Lime sulfur mixture and dilute with a large amount of water.
15 Transport Information
Caution to transport
1. Handle container with enough care not to damage container.
   Do not drop container or give shock/impact and avoid any damage onto container
   Keep container dry and do not get wet.
   Keep away from exhaust gas out of truck/car.
2. Keep container upright and properly tighten not to fall down.
   Make sure not to allow water/humidity get into container.
   Avoid direct exposure of sunlight.
3. Do not put together with chlorinated isocyanuric acid.
4. Do not put together with hazardous material controlled by Fire Defense Law.
   i.e. Group: Ⅱ,Ⅲ, Ⅳ, Ⅴ (Fire Defense Law of Japan)
5. Prevent any contact with water, acid, other chlorine material, reducing agents, oil&fat, grease
   and any other combustible material.

ID No UN3487
Hazard Class 5.1
Sub risk 8
Marine pollutant yes
Packing group Ⅱ

16 Regulatory Information
Available Laws and regulations
1. Fire Defense Law of Japan
   Hazards Group: Group I: Calcium Hypochlorite, designated amount (50 kg)
2. Industrial Safety Health Act
   Dangerous: Oxidizing substances
3. Rules and Regulations for Dangerous Goods Transport by Ship and Storage
   Oxidizing substances
4. Port and Harbor Law of Japan
   Oxidizing substances
5. ICAO/IATA:
   Oxidizing substances
6. Japan Railways Freight Transport Regulation
   Dangerous goods
7. IMO/IMDG:
   Class 5.1, Packaging group Ⅱ

17 Additional Information
Important
These information is believed to be correct but it is provided without representation,
guarantee or warranty, expressed or implied as to the accuracy or correctness,
reliability or completeness of the information.
It does not assumed any responsibility for injury, damage or loss arising from the use
of the material.
The information is intended for use of appropriate and safety precautions and handling.
In case of special handling, new directions and rules are necessary for safety protection.
Reference:
2) “Agricultural Chemicals Times” No 162, 54 edited by Japan Soda Co., Ltd.
   Agricultural Chemicals Development Department (2000)
Inquiries:
Nankai Chemical Co., Ltd.
Tosa Factory, Manufacturing Dept.
Quality & Control Assurance Sect
Tel +81-88-831-6191 Fax +81-88-831-6461