Brenntag Canada Inc.

MATERIAL SAFETY DATA SHEET

CALCIUM HYPOCHLORITE, SOLID

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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

1 855 273 6824

PRODUCT IDENTIFICATION

Product Name:	Calcium Hypochlorite, Solid.
Chemical Name:	Hypochlorous acid, calcium salt.
Synonyms:	HTH Dry Chlorine Granular; Calcium Hypochlorite Granular; Calcium Hypo; Calcium Hypo Pitchl Gran 65%; Cal Hypo Comm 65% Tabs; Calcium Hypo PPG 3" Tabs; Accu-Tab White, Blue, SI, Blue SI, White SI Tabs.
Chemical Family:	Hypochlorous acid salt.
Molecular Formula:	Ca (ClO) 2.
Product Use:	Swimming pool water disinfectant. Water treatment. Oxidizing agent. Chemical intermediate.

WHMIS Classification / Symbol:

C: Oxidizer
E: Corrosive

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

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

Ingredient	*CAS#*	*ACGIH TLV (TWA)*	*% Concentration*
Calcium Hypochlorite	7778-54-3	---	60 - 80
Sodium Chloride	7647-14-5	---	10 - 30
Calcium Carbonate	471-34-1	---	1 - 5
Calcium Hydroxide	1305-62-0	5 mg/m^3	1 - 5
Calcium Chlorate	10137-74-3	---	0 - 3

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Corrosive! Causes severe skin and eye burns. Dust is extremely irritating to respiratory tract. See "Other Health Effects" Section. Oxidizing material. Contact with other combustible material can cause fire. This material is a strong oxidizer which is stable under normal conditions, but can decompose if contaminated. Contact with other combustible material can cause fire. Can decompose at high temperatures forming toxic gases. Contamination with moisture, acids, organic matter, other chemicals (including, but not limited to cleaning chemicals and other pool chemicals), petroleum or paint products or other easily combustible materials may start a chemical reaction with generation of heat, liberation of hazardous gases and possible violent reaction leading to fire or explosion. (3)
POTENTIAL HEALTH EFFECTS	
Inhalation:	Corrosive! If mixed with acids or warmed, hypochlorite solutions release Chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of Chlorine gas may result in severe lung damage. (3)
Skin Contact:	This product may cause irritation due to abrasive action. May cause defatting, drying and cracking of the skin. Calcium Hypochlorite may cause symptoms of skin irritation such as reddening, swelling, rash, scaling, or blistering. Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3) Calcium Hydroxide: Many cases of chemical burns to the skin have been reported after exposure to wet (Calcium Oxide-containing) cement for as little as half an hour. The Calcium Oxide in the cement reacts with water forming calcium hydroxide. Often, no pain is experienced immediately, so the exposure (skin contact) is allowed to continue. (4)
Skin Absorption:	Not likely to be absorbed through the skin. Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin.
Eye Contact:	Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur.
Ingestion:	Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur. May be fatal if swallowed.
Other Health Effects:	Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. In general, long-term exposure to high concentrations of dust may cause increased mucous flow in the nose and respiratory system airways. This condition usually disappears after exposure stops. (4) Controversy exists as to the role exposure to dust has in the development of chronic bronchitis (inflammation of the air passages into the lungs). Other factors such as smoking and general air pollution are more important, but dust exposure may contribute. (4)

4. FIRST AID MEASURES

FIRST AID PROCEDURES	
General Guidelines:	Prompt removal of the material and obtaining medical attention are essential for all contact. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water. Continue the flushing during transportation to the emergency department. Corrosive effects may be delayed (up to 72 hours), and damage may occur without the sensation or onset of pain. Contact local poison control centre for further guidance.
Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.
Skin Contact:	Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Obtain medical attention IMMEDIATELY.
Eye Contact:	Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians:	Immediate consultation with the local Poison Control Centre should be initiated. Severe and sometimes delayed (up to 72 hours) local and systemic reactions can occur. Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation. Medical conditions that may be aggravated by exposure to this product include neurological, cardiovascular and skin disorders.

5. FIRE-FIGHTING MEASURES

Flashpoint (°C)	*AutoIgnition Temperature (°C)*	**Flammability Limits in Air (%):** *LEL*	*UEL*
Non-combustible (does not burn).	Not applicable.	Not applicable.	Not applicable.

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include corrosive chlorine gas, hydrogen chloride, oxides of sodium, calcium and chlorine.
Unusual Fire or Explosion Hazards:	Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Under certain conditions Hypochlorites decompose to form chlorine gas. Periodic monitoring for chlorine may be necessary. (4) Contamination of Hypochlorites could ignite foreign material and create sufficient heat to cause product decomposition. (3) Hypochlorites may increase the burning rate of combustible materials with which it comes into contact. (4) Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Minimize air borne spreading of dust. Spilled material may cause floors and contact surfaces to become slippery. Product becomes slippery when mixed with water. Enforce NO SMOKING rules in area of use.
Sensitivity to Mechanical Impact:	Not expected to be sensitive to mechanical impact.
Rate of Burning:	Not available.
Explosive Power:	Not available.
Sensitivity to Static Discharge:	Not expected to be sensitive to static discharge.
EXTINGUISHING MEDIA	
Fire Extinguishing Media:	Water in large quantity is an effective extinguishing agent for decomposition reactions and fires. Do not use dry extinguishers containing ammonium compounds. Do not use carbon dioxide or dry chemical. Use media appropriate for surrounding fire and/or materials.
FIRE FIGHTING INSTRUCTIONS	
Instructions to the Fire Fighters:	Spilled material may cause floors and contact surfaces to become slippery. Product becomes slippery when mixed with water.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

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

Containment and Clean-Up Procedures:	See Section 13, "Deactivating Chemicals". In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Keep away from combustibles and incompatible materials. Minimize air borne spreading of dust. Wear respirator, protective clothing and gloves. Avoid dry sweeping. Do not use compressed air to clean surfaces. Vacuuming is preferred. Return all material possible to container for proper disposal. Any recovered product can be used for the usual purpose, depending on the extent and kind of contamination. Where a package (drum or bag) is damaged and / or leaking, repair it, or place it into an over-pack drum immediately so as to avoid or minimize material loss and contamination of surrounding environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dikes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING	
Handling Practices:	Use normal "good" industrial hygiene and housekeeping practices. Clean up immediately to eliminate slipping hazard. Avoid moisture contamination. Keep away from combustibles and incompatible materials. Product becomes slippery when mixed with water. ALWAYS ADD PRODUCT TO LARGE QUANTITIES OF WATER TO FULLY DISSOLVE PRODUCT. DO NOT POUR WATER INTO PRODUCT, ALWAYS ADD PRODUCT TO WATER. DO NOT USE WITH STABILIZED CHLORINE OR BROMINE TABLET CHEMICAL FEEDERS. Do not add this product to any dispensing device containing remnants of any other product or pool chemical. (3)
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing dusts. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Immerse contaminated clothing in water immediately and KEEP WET until discarded or laundered. Contamination with moisture, acids, organic matter, other chemicals (including, but not limited to cleaning chemicals and other pool chemicals), petroleum or paint products or other easily combustible materials may start a chemical reaction with generation of heat, liberation of hazardous gases and possible violent reaction leading to fire or explosion. (3)
STORAGE	
Storage Temperature (°C):	Do not expose sealed containers to temperatures above 52 °C. (3)
Ventilation Requirements:	Ventilation should be corrosion proof.
Storage Requirements:	Store in a cool, dry and well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Avoid moisture contamination. Prolonged storage may result in lumping or caking. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Protect from direct sunlight. Protect against physical damage.
Special Materials to be Used for Packaging or Containers:	Confirm suitability of any material before using. Attacks some types of rubber, plastics and coatings.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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

ENGINEERING CONTROLS	
Engineering Controls:	Local exhaust ventilation required. Ventilation should be corrosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense dust may collect.
PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Eye Protection:	Safety glasses with side shields are recommended to prevent eye contact. Use full face-shield or chemical safety goggles when there is potential for contact. Contact lenses should not be worn when working with this material.

Skin Protection:	Gloves and protective clothing made from butyl rubber, nitrile rubber or neoprene should be impervious under conditions of use. Prior to use, user should confirm impermeability. Discard contaminated gloves. Attacks some types of rubber, plastics and coatings.
Respiratory Protection:	No specific guidelines available. DO NOT USE chemical cartridge respirators with oxidizable sorbents (charcoal). A NIOSH/MSHA-approved air-purifying respirator equipped with dust, mist, fume filter and chlorine cartridges for concentrations up to 5 ppm for Chlorine vapours or 50 mg/m^3 (Calcium Hydroxide). A NIOSH/MSHA-approved self-contained breathing apparatus if concentrations are higher or unknown. If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (6)
Other Personal Protective Equipment:	Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact.

EXPOSURE GUIDELINES

SUBSTANCE	***ACGIH TLV***	***OSHA PEL***		***NIOSH REL***	
	(STEL)	***(TWA)***	***(STEL)***	***(TWA)***	***(STEL)***
Calcium Hypochlorite	---	---	---	---	---
Sodium Chloride	---	---	---	---	---
Calcium Carbonate	—	5 mg/m^3 (Respirable fraction)	---	5 mg/m^3 (Respirable fraction)	---
Calcium Hydroxide	—	5 mg/m^3 (Respirable dust)	---	5 mg/m^3	---
Calcium Chlorate	---	---	---	---	---

Particulate Not Otherwise Classified:

ACGIH	OSHA
10 mg/m^3 - Inhalable particulate	50 mppcf* or 15 mg/m^3 - Total Dust
3 mg/m^3 - Respirable particulate	15 mppcf* or 5 mg/m^3 - Respirable Fraction

* mppcf = million particles per cubic foot

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

Physical State:	Solid.
Appearance:	Dry, white granules: fine sized, beads, pucks, or powder.
Odour:	Slight chlorine odour.
Odour Threshold (ppm):	Not applicable.
Boiling Range (°C):	Not available.
Melting/Freezing Point (°C):	Not available.
Vapour Pressure (mm Hg at 20° C):	Not applicable.
Vapour Density (Air = 1.0):	Not applicable.
Relative Density (g/cc):	Not available.
Bulk Density:	1.07 - 1.4 g/cm^3
Viscosity:	Not applicable.
Evaporation Rate (Butyl Acetate = 1.0):	Not applicable.
Solubility:	Soluble in water.
% Volatile by Volume:	Not applicable.
pH:	10.8 (10% solution)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not applicable.
Flashpoint (°C):	Non-combustible (does not burn).

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not flammable. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Decompositon will occur above 170 °C.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Moisture and heat sensitive. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Minimize air borne spreading of dust. Clean up immediately to eliminate slipping hazard. Contamination with moisture, acids, organic matter, other chemicals (including, but not limited to cleaning chemicals and other pool chemicals), petroleum or paint products or other easily combustible materials may start a chemical reaction with generation of heat, liberation of hazardous gases and possible violent reaction leading to fire or explosion. (3)
Materials to Avoid:	This product is a strong oxidizer. Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants. Reducing agents. Lewis or mineral acids. Organic materials. Combustibles. Nitrogen containing compounds. Ammonia Nitrates. Alkalis. Hydroxyl bearing compounds. Metal Oxides. Metals. Sulphur containing materials. Isocyanurates. Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Fluorines will react with calcium hydroxide to evolve much heat and some light. Aldehydes. Turpentine.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include corrosive chlorine gas, hydrogen chloride, oxides of sodium, calcium and chlorine.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***
Calcium Hypochlorite	850 mg/kg (1,3)	> 1 000 mg/kg (3)	875 mg/m³ (3)
Sodium Chloride	3 000 mg/kg (1,3)	---	---
Calcium Carbonate	6 450 mg/kg (1)	---	---
Calcium Hydroxide	7 340 mg/kg (1)	---	---
Calcium Chlorate	---	---	---

Carcinogenicity Data:	IARC reviewed studies conducted with several hypochlorite salts. IARC has classified hypochlorite salts as having inadequate evidence for carcinogenicity to humans and animals. IARC therefore considered hypochlorite salts to be not classifiable as to their carcinogenicity to humans.
Reproductive Data:	No adverse reproductive effects are anticipated.
Mutagenicity Data:	No adverse mutagenic effects are anticipated. See "Other Studies Relevant to Material".
Teratogenicity Data:	No adverse teratogenic effects are anticipated. See "Other Studies Relevant to Material".
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	None known.

Other Studies Relevant to Material:	Calcium Hypochlorite is corrosive to the eyes. Application of finely ground Calcium Hypochlorite produced corrosive injury in rabbits. Superficial injury was observed in rabbits when a 5 % Calcium Hypochlorite solution in water (pH 11.5) was applied for 30 seconds and then rinsed off with water. (4) Calcium Hypochlorite is corrosive to the skin. Application of 0.5 g finely ground Calcium Hypochlorite moistened with water for 24 hours produced corrosive injury in rabbits. Healing did not occur within 21 days. (4) Calcium Hypochlorite has been tested for teratogenicity in laboratory animals. Results of this study have shown that Calcium Hypochlorite is not a teratogen. (4) Calcium Hypochlorite has been reported to produce mutagenic activity in two in vitro assays. It has, however, been shown to lack the capability to produce mutations in animals based on results from the micronucleus assay. In vitro assays frequently are inappropriate to judge the mutagenic potential of bactericidal chemicals due to a high degree of cellular toxicity. The concentration which produces mutations in these in vitro assays is significantly greater than the concentrations used for disinfection. Based on high cellular toxicity in in vitro assays and the lack of mutagenicity in animals, the risk of genetic damage to humans is judged not significant. (3) Calcium Hydroxide: Application of 10 mg (0.01 g) of solid Calcium Hydroxide caused severe eye irritation or corrosion in a modified Draize test. Healing did not occur within 21 days. Injury to the cornea resulted from exposure to a paste of Calcium Hydroxide for 1 minute, followed by cleaning and rinsing with a physiological salt solution. This injury reached a maximum at 24 hours after exposure and the eye had not returned to normal after 3 months. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Toxic to aquatic life. (3) Calcium Hypochlorite: 96-hour LC50 (Atlantic Silverside) = 37 µg/L (3) 48-hour EC50 (Daphnia Magna) = 0.73 - 0.79 ppm (3)
Environmental Fate:	Not available. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	Carefully neutralize by adding hydrogen peroxide: one US pint of 35 % hydrogen peroxide solution per pound of hypochlorite to be neutralized. Dilute the neutralized residue with water. (4) Neutralization is expected to be exothermic. Effervescence may result. Oxygen released on exothermic decomposition may support combustion.
Waste Disposal Methods:	This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.
Safe Handling of Residues:	See "Waste Disposal Methods".
Disposal of Packaging:	Empty containers retain product residue and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Treat package in the same manner as the product. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

UN2880, CALCIUM HYPOCHLORITE, HYDRATED, Class 5.1, PG II.

Label(s): Oxidizing Substances. Placard: Oxidizing Substances.

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

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

UN2880, CALCIUM HYPOCHLORITE, HYDRATED, Class 5.1, PG II.

Label(s): Oxidizer. Placard: Oxidizer.

CERCLA-RQ: 100 lbs / 45.5 kg Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

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

Controlled Products Regulations Classification (WHMIS):

C: Oxidizer
E: Corrosive

USA

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

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

INTERNATIONAL

Not available.

16. OTHER INFORMATION

REFERENCES

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

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

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

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