Material Safety Data Sheet Collection
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Sodium Silicate Solution
SOD7950

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Section 1 - Chemical Product and Company Identification 54/59

Material Name: Sodium Silicate Solution
CAS Number: 1344-09-8
Chemical Formula: Na_4O_4Si
Structural Chemical Formula: Na_4SiO_4
EINECS Number: 215-687-4
ACX Number: X1000140-0
Synonyms: 49FG; AGROSIL LR; AGROSIL S; AS BOND 1001; BRITESIL; BRITESIL H 20; BRITESIL H 24; CARSIL; CARSIL (SILICATE); DP 222; DRYSEQ; DUPONT 26; EPA PESTICIDE CHEMICAL CODE 072603; HK 30 (VAN); L 96 (SALT); METSO 99; N 38; PORTIL A; PYRAMID 1; PYRAMID 8; Q 70; SIKALON; SILICA E; SILICA K; SILICA N; SILICA R; SILICAN; SILICIC ACID,SODIUM SALT; SODIUM SESQUISILICATE; SODIUM BETA-SILICATE; SODIUM SILICATE; SODIUM SILICATE GLASS; SODIUM SILICATE SOLUTION; SODIUM SILICONATE; SODIUM WATER GLASS; SOLUBLE GLASS; STAR; WATERGLASS
General Use: For preserving eggs; fireproofing fabrics; detergent preparations; as an adhesive; waterproofing agent; in cements; in cold-water paints; manufacture of abrasive wheels; weighting silks; water softener. Also used in clarification of fruit juices and solutions.

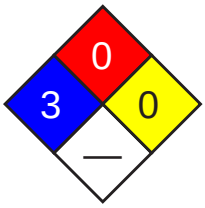
Section 2 - Composition / Information on Ingredients

Name	CAS	%
Sodium Silicate Solution	1344-09-8	>99

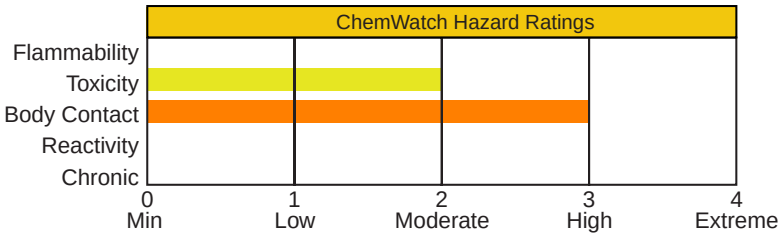
OSHA PEL **NIOSH REL**

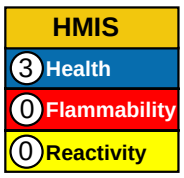
ACGIH TLV

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Danger!


Corrosive

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Colorless, possibly hazy liquid; odorless. Corrosive, causes severe burns to eyes/skin/respiratory tract. Other Acute Effects: cough, difficulty breathing, bronchitis, pneumonitis, erythema. Chronic Effects: possible urinary tract stones.

Potential Health Effects

Target Organs: eyes, skin, mucous membranes
Primary Entry Routes: inhalation, ingestion
Acute Effects
Inhalation: The mist is highly discomforting to the upper respiratory tract. Spray/mist inhalation may cause sore throat, coughing, shortness of breath, headache, dizziness and nausea which may lead to pulmonary edema with cyanosis or chemical pneumonia. The material may produce respiratory tract irritation which produces an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Unlike most organs the lung can respond to a chemical insult or agent by first trying to remove or neutralize the irritant and then repairing the damage. The repair process, which initially developed to protect mammalian lungs from foreign matter and antigens, may however, cause further damage to the lungs when activated by hazardous chemicals. The result is often the impairment of gas exchange, the primary function of the lungs.

Eye: The liquid/mist is highly corrosive to the eyes and is capable of causing severe damage with loss of sight. Eye contact with liquid and mists will cause redness, tearing, and blurred vision and can cause the severe or permanent injury of corneal burns or conjunctival ulceration. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Skin: The liquid is corrosive to the skin and is capable of causing chemical burns. Liquid on the skin may cause abnormal redness, rash, swelling, blisters or chemical burns. The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterized by skin redness (erythema) and swelling (edema) which may progress to vesiculation, scaling and thickening of the epidermis. Histologically there may be intercellular edema of the spongy layer (spongiosis) and intracellular edema of the epidermis.

Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

Ingestion: The liquid is highly discomforting to the gastro-intestinal tract and may cause severe mucous membrane damage. Ingestion may result in nausea, abdominal irritation, pain and diarrhea. Considered an unlikely route of entry in commercial/industrial environments. Ingestion may cause corrosion of the mucous membranes of the oral and alimentary canal resulting in nausea, vomiting, diarrhea, headache, weakness along with burning sensations in the mouth, esophagus and stomach. Can cause severe injury or death.

Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Chronic exposure may result in destruction of affected tissues and kidney damage.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. Lay patient down. Keep warm and rested. If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor.

Eye Contact: Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.

Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear. Wash affected areas with water (and soap if available) for at least 15 minutes. Transport to hospital, or doctor.

Ingestion: Contact a Poison Control Center. If swallowed, do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Alkalinity is high. Concentrated solutions may cause skin burns. Sodium metasilicate, which forms part of the product, is reported to have caused severe dermatitis reactions. Forms insoluble silica gels if acid neutralization is applied to skin.

For acute or short-term repeated exposures to highly alkaline materials:

1. Respiratory stress is uncommon but presents occasionally because of soft tissue edema.
2. Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
3. Oxygen is given as indicated.
4. The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
5. Alkali corrosives damage occurs by liquefaction necrosis whereby the saponification of fats and solubilization of proteins allow deep penetration into the tissue. Alkalis continue to cause damage after exposure.

INGESTION:

1. Milk and water are the preferred diluents. No more than 2 glasses of water should be given to an adult.
2. Neutralizing agents should never be given since exothermic heat reaction may compound injury.

* Catharsis and emesis are absolutely contra-indicated.
* Activated charcoal does not absorb alkali.
* Gastric lavage should not be used.

Supportive care involves the following:

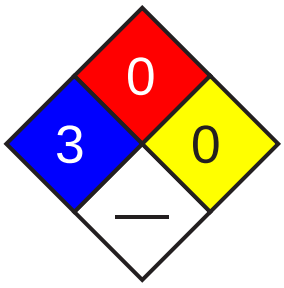
1. Withhold oral feedings initially.
2. If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
3. Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
4. Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

1. Injury should be irrigated for 20-30 minutes. Eye injuries require saline.

Section 5 - Fire-Fighting Measures

Flash Point: Nonflammable
Extinguishing Media: Use extinguishing media suitable for surrounding area.
General Fire Hazards/Hazardous Combustion Products: Non flammable liquid. Principal hazards are mists or splash of hot alkaline material. Avoid reaction with aluminium, zinc or tin. Flammable hydrogen gas may be formed on contact with metals.
Fire Incompatibility: Avoid contact with acids, aluminium, tin and zinc.
Fire-Fighting Instructions: Alert fire department and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or water ways. Do not approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.



Fire Diamond

Section 6 - Accidental Release Measures

Small Spills: Clean up all spills immediately. Wear protective clothing, impervious gloves and safety glasses. Increase ventilation. Wipe up and absorb small quantities with vermiculite or other absorbent material. Place in clean drum then flush area with water.
Large Spills: Clear area of personnel and move upwind. Alert fire department and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus.
Prevent, by any means available, spillage from entering drains or water ways. Increase ventilation. Slippery when spilled. Stop leak if safe to do so. Contain spill with sand, earth or vermiculite. Collect recoverable product into labeled containers for recycling. Absorb remaining product with sand, earth or vermiculite. Neutralize remaining product with dilute acid. Collect residues and seal in labeled drums for disposal. Wash area down with large quantity of water and prevent runoff into drains.
After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. If contamination of drains or waterways occurs, advise emergency services.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use good occupational work practice. Observe manufacturer's storing and handling recommendations. Avoid contact with skin and eyes. Avoid generating and breathing mist and vapor. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required. Avoid contact with incompatible materials. When handling, DO NOT eat, drink or smoke. Keep containers securely sealed when not in use. Avoid physical damage to containers.
Always wash hands with soap and water after handling. Work clothes should be laundered separately.
Recommended Storage Methods: Check that containers are clearly labeled. Plastic container. Do not store in glass containers.
Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated area. General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear a NIOSH-approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.
Personal Protective Clothing/Equipment:
Eyes: Chemical goggles. Full face shield.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.
Hands/Feet: Rubber gloves, neoprene gloves, PVC gloves, impervious gloves. Protective footwear; rubber boots, PVC boots.
Other: Overalls. Impervious apron. Impervious protective clothing. Eyewash unit. Ensure there is ready access to a safety shower. Equipment should be kept clean and in working order.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Colorless (or nearly colorless); possibly hazy, odorless liquid. Spills may be very slippery; soapy feel. Cold solutions have a very high viscosity. At 20 °C, viscosity range is 25-50000 centipoise. Soluble in water with a vigorous and exothermic reaction with the production of toxic and corrosive fumes. Soluble in some polyhydric alcohols. Slightly miscible with primary alcohols and ketones. Absorbs carbon dioxide on exposure to air, which results in the deposition of insoluble silica. The greater the ratio of sodium oxide to silica, the greater the alkalinity of the solution. Specific gravity increases with increased sodium oxide. The product does not contain free sodium oxide and silica. It comprises Na_2SiO_3 (metasilicate), $Na_2Si_2O_5$ (disilicate), Na_4-Si-O_4 (orthosilicate), $Na_6Si_2O_7$ (pyrosilicate) and various hydrates in a viscous, partly colloidal solution. Usual ratio of SiO_2:Na_2O is in range 3.2 - 2.0.

Physical State: Liquid
Vapor Pressure (kPa): 2.49
Vapor Density (Air=1): Not available.
Formula Weight: Not applicable
Specific Gravity (H_2O=1, at 4 °C): 1.3-1.7
Evaporation Rate: Not available

pH: 12.5 - 13.5
pH (1% Solution): 11.5 - 12.7
Boiling Point: Decomposes
Volatile Component (% Vol): 61-65 approx.
Decomposition Temperature (°C): Not available.
Water Solubility: Very slightly soluble in cold water

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable under normal handling conditions. Hazardous polymerization will not occur.
Storage Incompatibilities: Segregate from acids. Reacts with steel, bronze, brass and copper, aluminum, zinc and tin.

Section 11 - Toxicological Information

Toxicity
as disodium silicate
Oral (rat) LD_{50}: 1153 mg/kg

Irritation
Skin (human): 250 mg/24hr-SEVERE
Skin (rabbit):250 mg/24hr-SEVERE

Section 12 - Ecological Information

Environmental Fate: No data found.
Ecotoxicity: Aquatic toxicity: 2320 ppm/96 hr/mosquito fish/TL_m/fresh water
Biochemical Oxygen Demand (BOD): none

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible or consult manufacturer for recycling options. Follow all applicable federal, state, and local regulations. Treat and neutralize with dilute acid at an effluent treatment plant. Recycle containers; otherwise dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Shipping Name and Description: None

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Not listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.