

SODIUM SILICATE SOLUTION

GHS Safety Data Sheet

Version No:4

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

SODIUM SILICATE SOLUTION

OTHER NAMES

$\text{Na}_2\text{O}(\text{SiO}_2)_x(\text{H}_2\text{O})_y$, $\text{Na}_2\text{SiO}_3 \cdot \text{Na}_4\text{SiO}_4 \cdot \text{H}_2\text{O}$, "silicic acid disodium salt mixed", "Silicate of soda",

PRODUCT 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.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,

MUMBAI- 400030.INDIA.

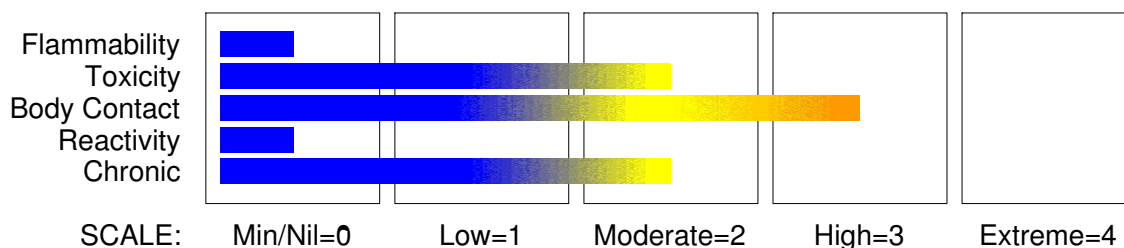
technical@sdfine.com

Telephone: 91- 22- 24959898

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HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 4
Eye Irritation Category 2A
Respiratory Irritation Category 3
Skin Corrosion/Irritation Category 2

continued...

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Section 2 - HAZARDS IDENTIFICATION



EMERGENCY OVERVIEW

HAZARD

WARNING

Determined by using GHS criteria:

H335 H302 H315 H319

May cause respiratory irritation

Harmful if swallowed

Causes skin irritation

Causes serious eye irritation

PRECAUTIONARY STATEMENTS

Prevention

Wash hands thoroughly after handling.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists, get medical advice/attention.

Wear eye/face protection.

If skin irritation occurs, seek medical advice/attention.

IF ON SKIN: Gently wash with plenty of soap and water.

Specific treatment: refer to Label or MSDS.

Remove/Take off immediately all contaminated clothing

Wash/Decontaminate removed clothing before reuse.

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sodium silicate solution	Not avail.	100

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.

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Section 4 - FIRST AID MEASURES

- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
 - If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
 - If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.
 - Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
 - INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- NOTE: Wear a protective glove when inducing vomiting by mechanical means.

EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - If pain persists or recurs seek medical attention.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

- For acute or short-term repeated exposures to highly alkaline materials:
- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
 - Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
 - Oxygen is given as indicated.
 - The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
 - Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.
- Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents
- No more than 2 glasses of water should be given to an adult.
- Neutralising 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.

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Section 4 - FIRST AID MEASURES

Supportive care involves the following:

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

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology].
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 (NIOSH). Forms insoluble silica gels if acid neutralization is applied to skin.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.
- 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.
- Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

- Non combustible.
 - Not considered a significant fire risk, however containers may burn.
- Decomposes on heating and produces acrid and toxic fumes of: silicon dioxide (SiO₂).
May emit poisonous fumes.
May emit corrosive fumes.

FIRE INCOMPATIBILITY

None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

Slippery when spilt.

- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.

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Section 6 - ACCIDENTAL RELEASE MEASURES

- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

Chemical Class: bases

For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
LAND SPILL - SMALL				
cross- linked polymer - particulate	1	shovel	shovel	R, W, SS
cross- linked polymer - pillow sorbent clay - particulate	1	throw	pitchfork	R, DGC, RT
foamed glass - pillow	2	shovel	shovel	R, I, P
expanded minerals - particulate	2	throw	pitchfork	R, P, DGC, RT
foamed glass - particulate	3	shovel	shovel	R, I, W, P, DGC
	4	shovel	shovel	R, W, P, DGC,
LAND SPILL - MEDIUM				
cross- linked polymer - particulate	1	blower	skiploader	R, W, SS
sorbent clay - particulate	2	blower	skiploader	R, I, P
expanded mineral - particulate	3	blower	skiploader	R, I, W, P, DGC
cross- linked polymer - pillow	3	throw	skiploader	R, DGC, RT
foamed glass - particulate	4	blower	skiploader	R, W, P, DGC
foamed glass - pillow	4	throw	skiploader	R, P, DGC., RT

Legend

DGC: Not effective where ground cover is dense

R; Not reusable

I: Not incinerable

P: Effectiveness reduced when rainy

RT:Not effective where terrain is rugged

SS: Not for use within environmentally sensitive sites

W: Effectiveness reduced when windy

Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;

R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988.

Slippery when spilt.

Moderate hazard.

Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

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SODIUM SILICATE SOLUTION

Section 6 - ACCIDENTAL RELEASE MEASURES

- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area 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.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin.

DO NOT use aluminium, galvanised or tin-plated containers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- 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. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

- Polyethylene or polypropylene container.
 - Packing as recommended by manufacturer.
 - Check all containers are clearly labelled and free from leaks.
- Do not store in glass containers

STORAGE INCOMPATIBILITY

For storage, no aluminium, light alloy, galvanised steel and glass receptacles or pipes should be used. On contact with aluminium or light alloys hydrogen gas may be evolved.

Steel, stainless steel and alkali stable plastic materials are generally appropriate.

Reacts with steel, bronze, brass and copper.

Avoid strong acids.

Avoid contact with copper, aluminium and their alloys.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

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Section 7 - HANDLING AND STORAGE

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

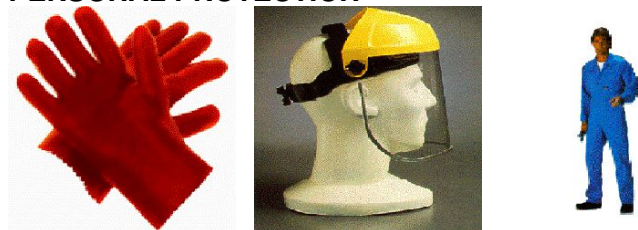
EXPOSURE CONTROLS

MATERIAL DATA

No specific exposure limits have been established for soluble silicates.

For liquids the creation of aerosols should be avoided. For powders, general dust exposure limits according to regulation will apply (typically 1- 10 mg/m³). For corrosive soluble silicates (Molar Ratio SiO₂:M₂O ≤1.6), the exposure limits set for sodium hydroxide should be considered as a guideline (2 mg/m³).

PERSONAL PROTECTION



EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
 - chemical resistance of glove material,
 - glove thickness and
 - dexterity,
- are important in the selection of gloves.
Wear chemical protective gloves, eg. PVC.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in special circumstances. If risk of overexposure exists, wear approved respirator. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. Provide adequate ventilation in warehouses and enclosed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Soluble alkali silicates are complex non-stoichiometric chemical substances better described as glasses or aqueous solutions of glasses resulting from combinations of alkali metal oxides and silica. They possess the general formula $M_2O \cdot xSiO_2$ where M is Na, K or Li and x is the molar ratio (MR), defining the number of moles silica (SiO_2) per mole of alkali metal oxide (M_2O).

In industry it is common practice to indicate the weight ratio (W) $SiO_2:M_2O$ which is derived from the MR by the following relationships: sodium silicates, $MR=1.032$ WR; potassium silicate, $MR=1.566$ WR; lithium silicates, $MR=0.5$ WR.

All these silicates are soluble and alkaline with pH values ranging between 10 to 13. The alkalinity of the product increases as the MR or WR is reduced.

With respect to EC Directives 67/458 (Dangerous Substances) and 91/155 (Dangerous Preparations) including relevant amendments (respectively 2001/59 and 2001/60), soluble silicates are classified as follows.

Molar Ratio $SiO_2:M_2O$
Powders
Liquids
≤ 1.6
Corrosive R34, 37 S22, 26, 36/37/39, 45
Corrosive R34 S26, 36/37/39, 45
$>1.6, \leq 2.6$
Irritant R37/38, 41 S22, 26, 36/37/39
Irritant R38, 41 S26, 36/37/39
>2.6
Irritant R36/37/38 S22, 26
Irritant R36/38 S26

Solutions of molar ratio >3.2 and concentrations $<40\%$ are not classified as dangerous or hazardous.

The classification of the different groups of soluble silicates is not related to pH value but is based on skin and eye irritation tests.

Soluble silicates classified as corrosive (molar ratio ≤ 1.6) are subject to UN Dangerous Goods Transport recommendations.

Colourless (or nearly colourless) possibly hazy, odourless, liquid.

Spills may be very slippery; soapy feel. Cold solutions have a very high

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

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 Na₂-Si-O₃ (metasilicate), Na₂-Si₂-O₅ (disilicate), Na₄-Si-O₄ (orthosilicate), Na₆-Si₂-O₇ (pyrosilicate) and various hydrates in a viscous, partly colloidal solution. Usual ratio of SiO₂: Na₂O is in range 3.2 - 2.0.

PHYSICAL PROPERTIES

Liquid.
Mixes with water.
Alkaline.

Molecular Weight: Not applicable
Melting Range (°C): - 1
Solubility in water (g/L): Miscible
pH (1% solution): 11.5 - 12.7
Volatile Component (%vol): 61- 65 approx.
Relative Vapour Density (air=1): Not available.
Lower Explosive Limit (%): Not applicable
Autoignition Temp (°C): Not applicable
State: Liquid

Boiling Range (°C): 101- 102
Specific Gravity (water=1): 1.3- 1.7
pH (as supplied): 14
Vapour Pressure (kPa): 2.49
Evaporation Rate: Not available
Flash Point (°C): Non- combustible
Upper Explosive Limit (%): Not applicable
Decomposition Temp (°C): Not available.
Viscosity: Not Available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

EYE

Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.

Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

Alkaline salts may be intensely irritating to the eyes and precautions should be taken to

continued...

SODIUM SILICATE SOLUTION

Section 11 - TOXICOLOGICAL INFORMATION

ensure direct eye contact is avoided.

SKIN

The material produces severe skin irritation; evidence exists, or practical experience predicts, that the material either:

- produces severe inflammation of the skin in a substantial number of individuals following direct contact, and/or
- produces significant and severe inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.
- Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

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

Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

The material is not thought to produce adverse health effects following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

CHRONIC HEALTH EFFECTS

Soluble silicates do not exhibit sensitising potential.

In vitro, soluble silicates do not induce gene mutations in bacteria; sodium silicate is negative in an E. coli reverse mutation assay and sodium metasilicate exerted no mutagenic activity in B. subtilis and S. typhimurium. In a study performed in accordance with OECD TG 473, an aqueous sodium silicate solution (36% active ingredient, R 3.3) induced no chromosomal aberrations in Chinese hamster V79 cells.

In vivo, sodium metasilicate did not induce chromosomal aberrations in bone marrow cells of mice in a study performed similarly to OECD TG 475. From the available evidence genotoxic potential for soluble silicates cannot be demonstrated

No indications of teratogenic effects for silicates have been reported.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

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

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Section 11 - TOXICOLOGICAL INFORMATION

TOXICITY AND IRRITATION

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (rat) LD50: 1153 mg/kg

IRRITATION

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

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

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 characterised by skin redness (erythema) thickening of the epidermis.

Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

Section 12 - ECOLOGICAL INFORMATION

Soluble silicates are wholly inorganic and once diluted have no significant environmental impact. They are saturated with respect to oxygen and as such do not possess a chemical oxygen demand (COD) or a biological oxygen demand (BOD). Depending on pH values soluble silicates in effluent and surface waters are rapidly dispersed and neutralised, by reaction with naturally occurring dissolved polyvalent metals (e.g. Ca, Mg, Al, Fe) forming insoluble silicates or amorphous silica. These products occur in abundance in natural soils and rocks. Dissolved silica resulting from commercial soluble silicates is also indistinguishable from naturally dissolved silica. The soluble silica input to the natural silica cycle from commercial use is furthermore inconsequential in view of the relative size and flux of the natural system. Concentrations of silica in natural waters commonly range from 1 to around 30 mg/l. Higher concentrations (up to 360 mg/l), however, have been found in some groundwaters where these high levels are related to rock type and water temperatures.

A study of the fate and possible effects of soluble silicates (waterglass) emissions to surface water has been performed by TNO (Apeldoorn NL, 2002). From the results of this study, no significant adverse effects to aquatic systems are to be assumed. Depending on pH values, reaction with naturally occurring dissolved polyvalent metals (e.g. Ca, Mg, Fe, Al) will result in insoluble silicate or amorphous silica being formed. These products occur in abundance in natural soils and rocks.

Dissolved silica resulting from commercial soluble silicates is also indistinguishable from naturally dissolved silica.

Soluble silicates are totally insoluble in n-octanol (and most other organic solvents).

The oil/water partition coefficient of these substances is therefore not applicable.

Soluble silicates have no potential for bioaccumulation.

Untreated soluble silicate solutions are generally alkaline (pH values > 9) and therefore neutralisation should be carried out before discharging to water/ effluent systems. Once neutralised, no adverse effects on aquatic biosystems are known.

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Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible.
 - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
 - Dispose of by: Burial in a licenced land-fill or incineration in a licenced apparatus (after admixture with suitable combustible material).
 - Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
 - Containers may still present a chemical hazard/ danger when empty.
 - Return to supplier for reuse/ recycling if possible.
- Otherwise:
- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
 - Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,
IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

sodium silicate solution (CAS:Not avail):
No regulations applicable

No data available for sodium silicate solution as CAS: Not avail.

Section 16 - OTHER INFORMATION

MSDS SECTION CHANGES

The following table displays the version number of and date on which each section was last changed.

Section Name	Version	Date	Section Name	Version	Date	Section Name	Version	Date
First Aid (eye)	4	5- Oct- 2006	Storage (storage incompatibility)	4	5- Oct- 2006	Instability Condition	4	5- Oct- 2006
First Aid (inhaled)	4	5- Oct- 2006	Storage (storage requirement)	4	5- Oct- 2006	Acute Health (eye)	4	5- Oct- 2006
First Aid (skin)	4	5- Oct- 2006	Storage (suitable container)	4	5- Oct- 2006	Acute Health (inhaled)	4	5- Oct- 2006
First Aid (swallowed)	4	5- Oct- 2006	Engineering Control	4	5- Oct- 2006	Acute Health (skin)	4	5- Oct- 2006
Fire Fighter (extinguishing media)	4	5- Oct- 2006	Exposure Standard	4	5- Oct- 2006	Acute Health (swallowed)	4	5- Oct- 2006
Fire Fighter (fire fighting)	4	5- Oct- 2006	Personal Protection (eye)	4	5- Oct- 2006	Chronic Health	4	5- Oct- 2006
Fire Fighter (fire incompatibility)	4	5- Oct- 2006	Personal Protection (hands/feet)	4	5- Oct- 2006	Toxicity and Irritation (Other)	4	5- Oct- 2006

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Section 16 - OTHER INFORMATION

Fire Fighter (fire/explosion hazard)	4	5- Oct- 2006	Personal Protection (other)	4	5- Oct- 2006	Environmental	4	5- Oct- 2006
Spills (major)	4	5- Oct- 2006	Appearance	4	5- Oct- 2006	Disposal	4	5- Oct- 2006
Spills (minor)	4	5- Oct- 2006	Physical Properties	4	5- Oct- 2006	Transport	4	5- Oct- 2006
Handling Procedure	4	5- Oct- 2006						

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 5-Oct-2017