

Soluble Silicon Fertilizer (Liquid Formulation)

1. Identification

Product Identifier: Soluble Silicon Fertilizer (Liquid Formulation).

Chemical Name: Potassium Silicate Solution.

Other Means of Identification: Soluble Silica, Silicic acid potassium salt, Liquid Silicon.

Recommended Use: Agricultural and horticultural fertilizer to enhance crop structural strength and stress tolerance.

Restriction on Use: Use only in accordance with label instructions. Do not mix directly with acidic fertilizers (causes immediate gelling/precipitation).

Supplier Details:

Emergency Phone Number:

2. Hazard(s) Identification

GHS Classification:

Skin Corrosion/Irritation: Category 2

Serious Eye Damage/Eye Irritation: Category 1

Specific Target Organ Toxicity (Single Exposure) [Respiratory tract irritation]: Category 3

Signal Word: DANGER

Hazard Pictograms:

Exclamation Mark (GHS07) — For skin and respiratory irritation.

Corrosion (GHS05) — For serious eye damage.

Hazard Statements:

H315: Causes skin irritation.

H318: Causes serious eye damage.

H335: May cause respiratory irritation.

Precautionary Statements:

Prevention: P261: Avoid breathing mists, vapors, or sprays. P264: Wash hands and exposed skin thoroughly after handling. P280: Wear protective gloves, protective clothing, eye protection, and face protection.

Response: P302+P352: IF ON SKIN: Wash with plenty of soap and water. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER or doctor/physician.

Storage/Disposal: P403+P233: Store in a well-ventilated place. Keep container tightly closed. P501: Dispose of contents and container in accordance with local and national regulations.

3. Composition / Information on Ingredients

Chemical Name	CAS Number	Weight %	GHS Classification
Potassium Silicate	1312-76-1	10% – 30% (<i>Adjust to match label</i>)	Skin Irrit. 2 (H315); Eye Dam. 1 (H318); STOT SE 3 (H335)
Water	7732-18-5	Balance to 100%	Not Hazardous

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4. First-Aid Measures

Inhalation: Move exposed person to fresh air. If breathing is difficult, give oxygen. Seek medical attention if respiratory irritation persists.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Wash clothing before reuse. Seek medical attention if irritation develops.

Eye Contact: Immediately flush eyes with gently flowing water for at least 15 to 20 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Get immediate medical attention / call a poison control center.

Ingestion: Rinse mouth thoroughly with water. Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

Most Important Symptoms: Immediate severe watering, burning, and redness of the eyes with risk of irreversible corneal damage. Redness, drying, and itching of the skin.

Immediate Medical Attention: Treat symptomatically. Alkaline solution; do not attempt to neutralize on skin or eyes with weak acids.

5. Fire-Fighting Measures

Suitable Extinguishing Media: Use an extinguishing agent suitable for the surrounding fire (water spray, dry chemical, carbon dioxide, or foam).

Unsuitable Extinguishing Media: None known.

Specific Hazards: Product is an aqueous liquid and is non-flammable and non-combustible. High heat from surrounding fire can dry the product, leaving a solid silicate residue. Flammable hydrogen gas may be produced if the liquid comes into contact with aluminium, zinc, or tin.

Special Protective Equipment: Firefighters must wear self-contained breathing apparatus (SCBA) and full protective bunker gear.

6. Accidental Release Measures

Personal Precautions: Wear appropriate personal protective equipment (chemical splash goggles, heavy gloves, boots). Spilled liquid is highly alkaline and creates an extremely slippery hazard.

Environmental Precautions: Prevent liquid from entering public sewers, watercourses, or soil. High pH levels are toxic to aquatic ecosystems.

Methods for Clean-Up: Dike and contain the spill. Neutralize carefully with a very dilute acid solution (like vinegar or weak citric acid) to lower pH under controlled conditions, or absorb with inert material (sand, clay, vermiculite). Scoop into designated chemical waste containers. Wash down the spill site with plenty of water.

7. Handling and Storage

Precautions for Safe Handling:

Prevent contact with eyes, skin, and clothing. Avoid generating or breathing airborne mists or sprays. Wear proper personal protective equipment. Wash thoroughly after handling.

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Conditions for Safe Storage:

Store in original, tightly closed containers in a cool, dry, well-ventilated area. Maintain storage temperatures between 5°C (41°F) and 35°C (95°F). Do not store in glass, aluminium, galvanized steel, or zinc containers, as the alkaline solution will react with or corrode these materials.

Incompatibilities:

Highly incompatible with acids, oxidizing agents, ammonium salts, and metals like aluminium and zinc.

8. Exposure Controls / Personal Protection

Control Parameters: No specific occupational exposure limits (PEL/TLV) are established for potassium silicate solutions. An internal ceiling limit of 2 mg/m³ for alkaline mists is generally recommended.

Appropriate Engineering Controls: Ensure eyewash stations and safety showers are close to the workstation. Use local exhaust ventilation or enclosed processing when mixing or spraying to minimize airborne mists.

Individual Protection Measures (PPE):

Eye/Face: Chemical splash goggles and a full face shield are highly recommended.

Skin: Chemical-resistant gloves (nitrile, neoprene, or PVC) and long-sleeved work clothing or a rubber apron.

Respiratory: If spraying creates dense mists or if ventilation is inadequate, use an approved particulate/mist respirator mask (e.g., N95 or half-mask with mist cartridges).

9. Physical and Chemical Properties

Appearance: Clear to slightly hazy, colorless, viscous liquid.

Odor: Odorless or very mild soapy odor.

pH: 11.0 – 12.5 (Highly alkaline).

Melting/Freezing Point: ~ -1°C (30°F).

Boiling Point: ~ 100°C (212°F).

Flash Point: Not applicable (Aqueous solution).

Evaporation Rate: Same as water.

Flammability: Non-flammable.

Vapor Pressure/Density: Same as water.

Relative Density: 1.15 – 1.35 g/cm³ (depending on concentration).

Solubility: Miscible and fully soluble in water.

Auto-ignition Temperature: Not applicable.

Decomposition Temperature: No data available.

10. Stability and Reactivity

Reactivity: Reacts exothermically with acids. Reacts with aluminium, zinc, and tin to produce flammable hydrogen gas.

Chemical Stability: Stable under recommended storage and handling conditions.

Soluble Silicon Fertilizer (Liquid Formulation)

Possibility of Hazardous Reactions: Contact with acids causes rapid gelation (gel formation). Will not undergo hazardous polymerization.

Conditions to Avoid: Extreme heat, freezing conditions, and contact with incompatible materials.

Incompatible Materials: Strong acids, strong oxidizing agents, aluminum, zinc, tin, and glass.

Hazardous Decomposition Products: None under normal storage. Thermal decomposition can yield potassium oxides and silicon dioxide.

11. Toxicological Information

Likely Routes of Exposure: Eye contact, skin contact, inhalation of mists.

Symptoms of Exposure:

Inhalation: Irritation of the mucous membranes and respiratory tract; coughing and sore throat.

Skin Contact: Causes irritation, redness, pain, and localized drying. Prolonged contact can cause mild chemical burns.

Eye Contact: Causes severe irritation, deep pain, burns, corneal clouding, and potentially permanent eye damage or blindness.

Ingestion: Causes burning irritation to the mouth, throat, and esophagus; nausea, vomiting, and abdominal pain.

Numerical Measures of Toxicity: Potassium Silicate: Oral LD50 (Rat): 5700 mg/kg; Dermal LD50 (Rat): >5000 mg/kg.

Carcinogenicity: None of the components are listed as carcinogens by IARC, NTP, or OSHA.

12. Ecological Information

Ecotoxicity: This product is toxic to aquatic life solely due to its high alkalinity. Once diluted or neutralized in soil/water to a normal pH, it becomes non-toxic.

Persistence and Degradability: Soluble silicates rapidly depolymerize in dilute solutions into molecular forms indistinguishable from natural dissolved silica.

Bioaccumulative Potential: Does not bioaccumulate.

Mobility in Soil: Highly mobile in water until neutralized by natural soil buffering capacity.

13. Disposal Considerations

Waste Treatment: This product, if unaltered, is classified as a hazardous waste due to its high pH corrosivity (RCRA Corrosive Waste Code D002 if $\text{pH} \geq 12.5$). Do not discharge directly into sewers or the environment. Neutralization and disposal must be conducted according to local, regional, and national environmental laws.

Container Disposal: Triple-rinse empty packaging with water before recycling or disposing of in an authorized landfill.

14. Transport Information

Central Motor Vehicles Rules (CMVR), 1989: For road transport across Indian states, specify that the transport vehicle must carry a TREM Card (Transport Emergency Card) if the liquid concentration is high enough to be classified as corrosive ($\text{pH} \geq 12.5$).

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Transport Hazard Class: Not applicable.

Packing Group: Not applicable.

Environmental Hazards: Not a marine pollutant.

15. Regulatory Information

The Factories Act, 1948 (Schedule 2): Governs permissible exposure limits for chemical substances in Indian factories.

Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989: Cite this to clarify if your potassium silicate concentration triggers hazardous storage thresholds under Indian law.

Central Pollution Control Board (CPCB) / State Pollution Control Board (SPCB)

Guidelines: State that disposal must comply with air and water pollution prevention acts (e.g., Water Act 1974, Air Act 1981).

Bureau of Indian Standards (BIS): If your fertilizer complies with an Indian Standard (like IS 4701 or similar specifications for agricultural inputs), mention it here

16. Other Information

NFPA 704 Rating: Health: 2 | Flammability: 0 | Instability: 0 | Special: None

HMIS Rating: Health: 2 | Flammability: 0 | Physical Hazard: 0

Revision Date: August 11, 2026.

Disclaimer: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. It is intended solely as guidance for safe handling, use, processing, storage, transportation, and disposal.