SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1. Product identifier

Name and identification number:	**Silicic acid, potassium salt; MR > 3.2; lumps**
CAS number:	**1312-76-1**
EC number:	**215-199-1**
The registration number:	**01-2119456888-17-0005**
Index Number:	**none**
EC name:	**silicic acid; potassium salt**
CAS name:	**silicic acid; potassium salt**
Other names:	**glassy potassium silicate MR >3,2;** **potassium silicate MR > 3,2.**
Trade name:	**VITROSIL P** *

Note: Potassium silicates are produced with a different molar ratio (MR), defined as the molar ratio of $Si0_2$ *to* K_2O *in the substance in solid (lump or powder) or liquid form. MR and physical state have a significant impact on classification and labelling.*

* An appropriate numerical symbol corresponding to the type of product within the scope of the indicated module is added to the trade name.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Formulation (e. g. detergents, adhesives, adhesives, surface technologies). Industrial applications (e. g. production of water glass, production of silicates, production and application of liquid and solid detergents for washing fabrics, dishwashing, industrial detergents and disinfectants, production of adhesives and binders in various branches of industry - paper, ceramics, building materials and refractory, casting, insulation of plastics, anti-dust and anti-smoking agents, production of paints, including anti-corrosion paints plaster, impregnants, stabilizers, viscosity regulators. Professional applications (such as detergents, adhesives, adhesives, surface technologies).

Uses advised against not identified.

1.3. Details of the supplier of the safety data sheet

Producer: QEMETICA Silicates S. A.
Address: POLAND, PL 68-120 IŁOWA, 27 Żagańska Street
Telephone: tel. +48 68 360 07 47
E-mail address of the person responsible for the SDS
SDS@qemetica.com

1.4. Emergency telephone number

112 (emergency call), 999 (emergency telephone number)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation 1272/2008/EC:
Does not meet the criteria for classification.

2.2. Label elements

Label accordance with Regulation 1272/2008/EC (CLP)
Hazard pictograms, signal words: None.
Hazard statements: None.
Precautionary statements: None.

2.3. Other hazards

Potential hazard exists at workstations: possible release of dust, which may exceed the NDS for non-toxic dust (see section 8.1).
The substance does not meet the PBT and vPvB criteria. The criteria described in Annex XIII to the decree. REACH (PBT and vPvB properties) does not apply to inorganic substances.
The substance is not included in the list established in accordance with Article 59 (1) of REACH as having endocrine disrupting properties. The substance does not meet the criteria for endocrine disruptors as defined by Commission Regulation (EU) 2017/2100 (EU OJ L 301, 17. 11. 2017) and Commission Regulation (EU) 2018/605 (EU OJ L 101, 20. 04. 2018).

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name:	**Silicic acid, potassium salt MR > 3.2; lumps**
Content of pure substance:	**99% ww (K_2O+SiO_2)**
Common proper name:	**glassy potassium silicate MR > 3.2**
EC name:	**silicic acid, potassium salt; No EC: 215-199-1**
CAS name:	**silicic acid, potassium salt; No CAS: 1312-76-1**
IUPAC name:	**potassium hydroxy(oxo)silanolate**
Chemical formula:	**K_2O x $nSiO_2$**

Description of substance: UVCB inorganic substance. Is a composition of oligomers of SiO_4 silicate anions combined with potassium cations.
The structural structure of the substance and its properties depend on the SiO_2 to Na_2O molar ratio (MR).
Description of impurities: Occurring contaminants below 1% of the above do not affect the classification of the substance. These are metal oxides derived from raw materials (quartz sand) e.g., oxides of: calcium, magnesium, aluminium, titanium, iron, etc.

SECTION 4: First aid measures

4.1. Description of first aid measures

General instructions: Persons carrying first aid should wear personal protective equipment. In case of contact with the product, always bring a doctor and present him with the label and product safety data sheet.
Inhalation: Move the victim out of the place of exposure, put him in a comfortable reclining position or sitting position, ensure peace, protect against heat loss. Place the unconscious in a stable position on the side. In case of apnoea, apply artificial respiration. Ensure access to fresh air and peace. Call a physician immediately
Skin contact (or hair): Soiled, soaked cover should be removed immediately. Rinse skin and hair under a strong jet of water or shower. Immediately wash contaminated skin for 10-15 minutes with plenty of water. In case of contamination of a large area of skin immediately go for a shower. Call a doctor if you experience worrying symptoms.
Eye contact: Remove contact lenses, if present and easy to do. Immediately flush contaminated eyes with plenty of water for 10-15 minutes. Keep eyelids wide open to rinse the entire surface of the eyes with water, including the eyelids. Call a physician immediately. During transportation to the doctor should continue flushing eyes.
Ingestion: Rinse mouth with water. Give plenty of water to drink to conscious person in small portions. Do not induce vomiting. Call a physician immediately.

Responders should use appropriate personal protective equipment (see section 8.2.2.), provide adequate general and local ventilation, avoid direct contact with the substance. Avoid inhalation of dust, aerosols, and vapours.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation: May cause respiratory irritation.
Prolonged exposure may cause cough, headache, nausea.
Eye contact: May causes serious eye damage.
Skin contact: May causes severe skin irritation.
Ingestion: Causes damage to mucosa.

4.3. Indication of any immediate medical attention and special treatment needed

The decision on further emergency treatment should be made by a doctor after a thorough assessment of the victim's condition. Use symptomatic treatment.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Non-flammable and does not support smoking.
Extinguishing measures to suit nearby materials.
Unsuitable extinguishing media: No data on non-recommended funds.

5.2. Special hazards arising from the substance or mixture

Non-flammable, non-explosive substance. At temperatures above 60°C, it reacts dangerously with aluminum and its alloys and zinc and its alloys. As a result of the reaction, hydrogen can be formed, generating a danger of explosion. It reacts violently with solutions of mineral acids (e. g. nitric, sulfuric) and with concentrated hydrofluoric acid.

5.3. Advice for firefighters

Use full protective equipment and airway isolation devices with independent air circulation. Containers exposed to fire or heat should be cooled with a jet of dispersed water from a safe distance and, if possible, removed from the endangered area. Protect surface and ground water, soil, and sewage from contamination. Fire water should be treated as a hazardous contamination and stored in separate containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel: Access of non-emergency personnel to the area of accident should be restricted until the completion of the disposal of the product. Wear appropriate personal protective equipment. Do not drink, eat, and smoke. Provide adequate local and general ventilation. Avoid direct contact with the substance. Protect eyes and skin. Avoid inhalation of aerosols and vapors.

For emergency responders: Wear appropriate personal protective equipment. Do not drink, eat and smoke. Provide adequate local and general ventilation. Avoid direct contact with the substance. Protect eyes and skin. Avoid inhalation of dust, aerosols, and vapours.

6.2. Environmental precautions

Do not allow the substance to enter drains, surface and ground waters, reservoirs and watercourses. In the event of contamination of the environment with a large amount of the preparation, notify the relevant authorities and chemical rescue services.

6.3. Methods and material for containment and cleaning up

Secure the drains. Secure damaged packages. Collect the product released into the environment mechanically and forward for utilization. Do not rinse with water, do not neutralize.

6.4. Reference to other sections

Personal protective equipment - see Section 8. Disposal - see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Do not allow the workplace environment to exceed the normative concentrations of hazardous components. Provide adequate general and local exhaust ventilation. Prevent from entering the sewage system, surface and ground water and soil. Prevent the use of mutually incompatible materials (see Section 10.5).

General labor hygiene regulations apply. When performing any activity with the substance, do not eat, drink, take medication or smoke. Avoid contact with eyes and skin. Avoid inhalation of dust, aerosols, and vapours. Remove contaminated clothing and protective equipment before entering eating areas. Wash hands and face before break and after working with the product. Wash the body surface and personal protective equipment after use. Change and clean contaminated clothing before reuse.

Use the protective measures listed in section 8.2.2.

7.2. Conditions for safe storage, including any incompatibilities

Store in bulk or in containers in covered, hardened landfills. Do not store in containers/tanks made of or coated with zinc or aluminium.
Store in a dry place.
Store away from non-compliant materials (referred to in section 10.5).

7.3. Specific end use(s)

Provided in Section 1. 2. Follow the instructions given in this card.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Substance name	TWA	STEL	BLV
Dusts	10 mg/m^3 (inhalable fraction) 4 mg/m^3 (respirable dust)	-	-

Legal basis: Ordinance on maximum permissible concentration and intensity of harmful factors in the work environment in accordance with national limit values.
EH40/2005 Workplace exposure limits, fourth edition, published 2020, ISBN 978 0 7176 6733 8.

In the REACH registration dossier, DNEL (derived no-effect level) values have been set out in accordance with the following tables.

For employees: employed in manufacturing and processing in which the concentration of the substance in the product and mixture exceeds 25%.

DNEL:

	DNEL Employees			
Route of exposure	Acute, local effects	Acute, systemic effects	Chronic, local effects	Chronic, systemic effects
Inhalation	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	5,61 mg/m^3
Through the skin	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	1,49 mg/kg b.w./day
Oral	No threat has been identified	No threat has been identified	No threat has been identified	No threat has been identified
On the eyes	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	No threat has been identified

The product in the form of lumps is not present on the consumer market.

PNEC:

Goal of environmental protection	**PNEC**
Freshwater	7,5 mg/l
Freshwater sediments	No threat has been identified
Seawater	1,0 mg/l
Marine sediments	No threat has been identified
Food chain	No threat has been identified
Microorganisms during wastewater treatment	348 mg/l
Soil (agricultural)	No threat has been identified
Air	No threat has been identified

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Do not allow the workplace environment to exceed the normative concentrations of hazardous components. Provide adequate general and local exhaust ventilation. Prevent from entering the sewage system, surface and ground water and soil.

Appropriate precautions for use and storage of the product are given in Section 7.

8.2.2. Individual protection measures, such as personal protective equipment

Eye/face protection: Wear protective clothing and gloves according to EN 374, material: NBR (nitrile rubber), thickness min 0. 3 mm, penetration time > 480 min (level 6).

Respiratory protection: If the product is used in large quantities indoors, adequate respiratory protection is required. Appropriate breathing apparatus should be used in an environment where there is a risk of exposure to dust, aerosol, or mist. At high concentrations, indoors, wear a half mask with ABEK class absorber with min. P2.

Thermal Hazards: Not required.

The individual protective equipment used should meet the requirements of Regulation (EU) 2016/425 of the European Parliament and of the Council of March 9, 2016, on personal protective equipment and repealing Council Directive 89/686/EEC (EU OJ L 81, 31. 03. 2016). The employer is obliged to provide individual protective equipment appropriate to the work performed and meeting all requirements, including their maintenance, and cleaning.

The concentration of hazardous substances in the working environment shall be monitored according to recognised test methods. The mode, methods, type and frequency of testing and measurement of factors harmful to health occurring in the working environment should meet the requirements of the Regulation of the Minister of Health of 2 February 2011 on testing and measurement of factors harmful to health in the working environment (Journal of Laws 2011 No. 33, item 166, as amended).

8.2.3. Environmental exposure controls

Do not allow the product to enter the groundwater, sewage system, wastewater, or soil. The substance does not pose significant risks to the environment, but due to its high alkaline reaction, it is recommended to neutralize it before discharge into water and wastewater.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Phvsical state	Solid in the form of shapeless hard lumps,
Colour	Colourless or bluish, greenish or celery
Odour	Odourless
Melting point/freezing point	Due to the glass nature, solid potassium silicate has no pronounced melting point: softening temperature: 700°C Melting temperature: 905°C Aqueous solutions have a slightly lower melting point than water.
Boiling point or initial boiling point and boiling range	According to Annex VII (point 7.3) of the REACH Regulation, tests do not need to be carried out for solids that melt above 300°C. The determination of the boiling point is not practical for solid anhydrous silicates as they are glass with a high melting point. The boiling point of aqueous solutions is determined by the water content.
Flammability	The tests do not need to be carried out as the substance is inorganic. Pyrophoricity is not a feature related to its chemical structure and experience in handling and use. The substance does not self-ignite in contact with air. Non-flammable substance. The substance does not heat itself.

Lower and upper explosion limit	Non-explosive substance. There are no chemical groups associated with explosive properties in the molecule, so according to Annex VII (section 7.11) of REACH, the test does not need to be conducted.
Flash point	According to Annex VII (Section 7.9) of REACH, a flash point test is not necessary because the substance is inorganic.
Auto-ignition temperature	Preliminary results rule out self-heating of the substance up to 400°C. According to Annex VII (section 7.12) of REACH, the test does not need to be conducted.
Decomposition temperature	No data available - the substance does not decompose at temperatures below 1400°C
pH	10-12 at 20°C
Kinematic viscosity	Not applicable - solid Aqueous solutions (with different concentrations and molar ratios of K_2O/SiO_2) have a dynamic viscosity of 30 – 280 mPa*s at 20°C.
Solubility	Product dissolves extremely slowly in water under ambient conditions. It is not possible to quantify the water solubility. Aqueous solutions are characterized by a dynamic equilibrium of polymerization/hydrolysis of monomeric SiO_2(aq.), oligomeric silicate ions and polysilicate ions, which is strongly pH dependent. The amorphous silica which precipitates after neutralization of alkaline silicate solutions has a water solubility of 115 mg/l at 25°C and an inert pH.
Partition coefficient n-octanol/water (log value)	The substance is inorganic, so according to Annex VII (section 7.8) of REACH, testing is not necessary. In addition, potassium silicate is insoluble in alcohol, indicating that this also applies to n-octanol. Therefore, the octanol/water partition coefficient is not applicable.
Vapour pressure	0.0103 hPa at 1172 °C
Density and/or relative density	1,26-1,6g/cm^3 (solutions)
Relative vapour density	Does not apply to solids.
Particie characteristics	Powder: 220 - 320 µm

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Not applicable.

9.2.2. Other safety characteristics

In aqueous solutions, it has a strong corrosive effect on most metals.

SECTION 10: Stability and reactivity

10.1. Reactivity

Alkaline substance, under normal conditions very slightly soluble in water. On the surface, it reacts with carbonic anhydride to form K2CO3, it can react with acid vapors.

10.2. Chemical stability

Substance stable under normal conditions of use, storage, and warehousing.

10.3. Possibility of hazardous reactions

Contact with strong acids and hydrofluoric acid causes heat generation. The reaction with hydrofluoric acid is accompanied by the release of dangerous gases (silicon tetrafluoride). Contact with aluminum or its alloys, zinc or its alloys, results in the release of hydrogen.

10.4. Conditions to avoid

Avoid contact with non-compliant materials (see section 10. 5). Protect from moisture.

10.5. Incompatible materials

Keep away from oxidizing agents, strong alkalis, strong acids and also alkali metals, alkaline earth metals, zinc, aluminum, tin, lead and their alloys.

10.6. Hazardous decomposition products

Under normal conditions of use and storage, the substance does not degrade.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity:

Based on available data, the classification criteria are not met.
The substance has no acute toxic effects by any route of exposure.
Silicic acid, potassium salt with MR modulus > 1,6 ≤ 2,6 [CAS: 1312-76-1]
Oral: LD_{50} (rat, *Sprague-Dawley*) > 5000 mg/kg b.w. (EPA OPPTS 870.1100) (Durando J., 2004)
Inhalation: LC_{50} (rat, *Sprague-Dawley*) > 2,06 g/m^3 (EPA OPPTS 870.1300) (Durando, J. 2004)
Skin: LD_{50} (rat*, Sprague-Dawley*) > 5000 mg/kg b.w. (EPA OPPTS 870.1200) (Durando, J. 2004)

Skin corrosion/irritation:

Based on the available data, the classification criteria are not met.
The substance (≥ 99%) may exhibit irritant to corrosive effects depending on the MR molar modulus. Corrosive/irritant effects decrease as MR increases. For MR 2.0 - 3.0 and 30 - 36%

the substance was irritating to the skin (Cuthbert and Carr 1985). while for MR 3.4 and 3.9 (29-35%) did not cause irritation. (Heisler, E. and Dickhaus, S. 1990, 1993).

Serious eye damage/irritation:

Based on the available data, the classification criteria are not met.

The substance (≥ 99%) may exhibit irritant to corrosive effects depending on the MR molar modulus. Corrosive/irritant effects decrease as MR increases. At concentrations up to 35%, potassium silicates with molar ratios of 2.47, 3.4 and 3.9 were only slightly or non-irritating to the eyes of rabbits (Heisler, E. and Dickhaus, S. 1990, Merkel, D. J. 2004).

Respiratory or skin sensitisation:

Based on the available data, the classification criteria are not met.

Potassium silicate and the cross-sectional substance sodium metasilicate did not show sensitization in two different skin sensitization assays (Buehler test and local lymph node assay - Durando, J. 2004, Karrow, NA et al. 2002). In the case report in humans, contact urticaria induced by sodium silicate was observed in one subject.

Germ cell mutagenicity:

Based on the available data, the classification criteria are not met.

The in vitro genetic toxicity of disodium metasilicate nonahydrate was investigated in the Ames assay (BASF SE, 2012). The test substance did not induce reversal in any of the strains of S. typhimurium or E. coli WP2 uvrA with or without metabolic activation. All other in vitro mutagenicity tests with bacteria were negative. Sodium silicate (MR = 3.3) also did not induce chromosomal aberrations and HPRT mutations in mammalian V79 cells in vitro, both in the presence and absence of metabolic activation. Sodium metasilicate did not induce chromosomal aberrations in mouse bone marrow in vivo. From the available results it can be concluded that there is no evidence of a genotoxic potential for potassium silicate.

Carcinogenicity:

Based on the available data, the classification criteria are not met.

There are no data indicating carcinogenic effects of soluble potassium silates. In addition, potassium silicate does not contain structures indicative of carcinogenic activity.

Reproductive toxicity:

Based on the available data, the classification criteria are not met.

No data are available for potassium silicate. Based on a cross-sectional grouping approach, no adverse effects of potassium silicate on reproduction were found based on the available negative results of diPotassium metasilicate studies in mice (Saiwai K. et al., 1980).

NOAEL (mice) > 200 mg/kg bw/day

STOT-single exposure:

Based on available data, the classification criteria are not met.

STOT-repeated exposure:

Based on the available data, the classification criteria are not met.

No studies are available for potassium silicate. Repeated-dose oral toxicity studies of sodium silicate and sodium metacilicate ranging from 4 weeks to 180 days were conducted in rats, mice, dogs, and turkeys. No administration-related effects were observed in rats (Ito, R. et al. 1975, Smith, G. S. et al. 1973), and decreased pituitary mass was observed in female mice at 716-892 mg/kg/day (sodium metacilicate; exposure for 3 months) (Saiwai, K. et al. 1980).

NOAEL (rats) > 159 mg/kg bw/day

The health effects of topical exposure are given in section 4. 2

11.2. Information on other hazards

11.2.1 Endocrine disrupting properties

The substance is not included in the list established in accordance with Article 59 (1) of REACH as having endocrine disrupting properties. The substance does not meet the criteria for endocrine disruptors as defined by Commission Regulation (EU) 2017/2100 (EU OJ L 301, 17.11.2017) and Commission Regulation (EU) 2018/605 (EU OJ L 101, 20.04.2018).

SECTION 12: Ecological information

12.1. Toxicity

The substance does not meet the criteria for classification as hazardous to the environment. Soluble silicates are indistinguishable from the natural forms of silicates, which make up 59% of the Earth's crust, and enter waterways through natural geochemical processes. Soluble silicates entering waters as a result of production and processing processes are not of anthropogenic significance.

Acute toxicity to fish:
LC_{50} (48h) (Leuciscus idus) > 146 mg/l (Richterich K. and Muehlberg B., 2001)

Chronic toxicity to fish:
Daphnia magna and Leuciscus idus were found to be the most sensitive species with LC_{50} values > 146 mg/l. Considering the presence of silica in European rivers at a mean concentration of 7. 5 mg SiO_2/l (Jorgensen et al., 1991), the NOEC for fish in chronic toxicity studies is expected to be comparable to the NOEC for dandelion and fish in short term tests. Further testing is not appropriate and should be avoided for animal welfare reasons.

Acute toxicity to invertebrates:
EC_{50} (24 h) (Daphnia magna)> 146 mg/l (Richterich K. and Muehlberg B., 2001)

Chronic toxicity to invertebrates:
In accordance with point 9. 1 of Annex IX of REACH, long-term toxicity studies on aquatic invertebrates do not need to be carried out as the available data on aquatic invertebrates show toxicity of potassium silicate well in excess of naturally occurring concentrations.

Algae and other aquatic plants:
EC_{50} (72h, biomass) (Scenedesmus subspicatus): 207 mg/l (Rieche, H. W. 1995)

Toxicity to sedimentary organisms
According to section 9.5.1 of Annex X to REACH, there is no need to conduct long-term toxicity studies to sediment organisms as dissolved silica from commercial soluble silicates is indistinguishable from natural dissolved silica. In addition, SiO_2 constitutes 59% of the Earth's crust, and similar amounts are found in many sediments and soils. The amount of soluble silicate introduced into the environment should be considered in the context of background contribution from geochemical aeration processes of silicate minerals. For example, the total flow of dissolved

silicates transported by rivers to the seas in Western Europe is estimated at 5 Mton SiO_2/year (Van Dokkum et al. 2004). The anthropogenic contribution to this total flow is only 4%, although the local contribution may be higher. The contribution of anthropogenic factors in the different ranges will be negligible compared to the concentrations to which the flow of natural silica contributes.

Toxicity to soil macroorganisms, terrestrial plants, soil microorganisms, bees:

In a honeybee study conducted according to EPA OPPTS 850. 3020, for potassium silicate solution (29.1% wt.) the 48-hour LD_0 and LD_{50} were determined to be 25 µg and > 25 µg of substance per animal, respectively (Richardsa K.B., 2006).

No further studies on the above toxicity for potassium silicate are available. According to Annex IX, p. 9. 4 and Annex X, p. 9. 4 of REACH, the tests need not be performed as direct emissions from soluble silicates to the terrestrial element are considered insignificant. Moreover, since silicates are natural constituents of soil minerals, such tests would be of limited value. SiO_2 accounts for 59% of the Earth's crust and similar percentages are found in many sediments and soils. The contribution of anthropogenic contributions to the presence of potassium salts of silicic acid in different ranges will be negligible compared to the concentrations to which the flow of natural silica contributes.

Toxicity to birds

According to section 9.6.1, Annex X of REACH, the test does not need to be conducted because direct emissions from soluble silicates into the terrestrial compartment are considered negligible. Since silicates are, moreover, natural components of soil minerals, such tests would be of limited value. SiO_2 accounts for 59% and similar percentages are present in many sediments and soils. The contribution of anthropogenic factors to the occurrence in different compartments will be negligible compared to the concentrations caused by the natural silica flux.

12.2. Persistence and degradability

Due to its chemical structure and inorganic nature, photodegradation of soluble silicates is not expected.

With regard to hydrolysis stability, it is highly dependent on the pH regime. The basic assumption is that silica dissolves according to: $SiO_2 + H_2O = Si(OH)_4$. At low concentrations it occurs as monomers, at higher concentrations polymerization will occur. Most soluble silicates are in the form: $M_2O \times mSiO_2 \times nH_2O$ where M = alkali metal, mainly Na, but also K. The m index (molar ratio) varies between 0.5 - 4. Above pH 10.6, the solutions are chemically stable. The increase in ionic strength accelerates nucleation and deposition and reduces the solubility of SiO_2. Coating the surface with organic matter can hinder dissolution, but at the same time $Si(OH)_4$ can form complexes with organic matter, which promotes dissolution (Falcone 1997).

As inorganic substances, soluble silicates are not biodegradable due to their chemical structure.

Elimination of sodium silicate in the model wastewater treatment plant was only marginal: 90-100% was detected in the wastewater. The study was conducted in accordance with GLP and EU guidelines 82/242/EEC and 82/243/EEC (Richterich 1994). Based on the same chemical properties of soluble silates, this test may also be considered for potassium silate.

What is more, silica is constantly being removed from water through biochemical processes: diatoms, radiolarians, silicic flagellates, and some sponges serve as a silicon sink, incorporating it into their shells and skeletons as amorphous biogenic silica, often referred to as opal (SiO_2-nH_2O). During blooms, they can deplete dissolved silica in surface waters to less than 1 mg/L (Edwards 1973).

Due to the low vapour pressure, volatility is also not expected.

12.3. Bioaccumulative potential

Low bioaccumulation potential.

Toxicokinetic data in vertebrates showed a low potential for bioaccumulation. Ingested soluble silicates are excreted in the urine and to a lesser extent in the faeces. Significantly increased and rapid urinary excretion of silica was observed when soluble potassium silicates were administered to rats (Benke and Osborn 1979), dogs (King et al. 1933), cats (King and McGeorge 1938) and guinea pigs (Sauer et al. 1959). The half-life in urinary excretion of silicon following administration of potassium silicate to rats via the gastric tube was 24 hours (Benke and Osborn 1979).

12.4. Mobility in soil

According to Annex VIII of REACH, adsorption/desorption screening does not need to be performed if the substance can be expected to have a low adsorption potential based on its physicochemical properties.

Based on the physicochemical properties of silicic acid, the potassium salt can be expected to have a relatively low adsorption potential to sediment and soil. Crystalline silicates, such as silicic acid, potassium salt are easily soluble in water and insoluble in alcohol. The expected relatively low adsorption potential is confirmed by measurements of soluble silicate removal at several wastewater treatment plants, where marginal removal by sedimentation and adsorption was determined to be 10% of the total amount (van Dokkum et al., 2004). Accurately predicting the distribution of soluble silicates in different environmental compartments is not possible, because there is a dynamic equilibrium between various mono-, oligo- and poly-bonded anions, depending on pH conditions and substance concentration. Sediments and soil particles are believed to act as a mechanism to buffer the concentration of dissolved silica in natural waters through sorption and desorption of dissolved silica (Schleyer and Blumberg, 1982). In this process, the anthropogenic contribution to various environmental compartments will be negligible compared to concentrations from the natural silica flux. Moreover, dissolved silica from commercially available soluble silicates is indistinguishable from natural dissolved silica (Schleyer and Blumberg, 1982). Due to the low vapour pressure, volatilisation is also not expected.

12.5. Results of PBT and vPvB assessment

The criteria described in Annex XIII (PBT and vPvB properties) do not apply to inorganic substances.

12.6. Endocrine disrupting properties

The substance is not included in the list established in accordance with Article 59 (1) of REACH as having endocrine disrupting properties. The substance does not meet the criteria for endocrine disruptors as defined by Commission Regulation (EU) 2017/2100 (EU OJ L 301, 17.11.2017) and Commission Regulation (EU) 2018/605 (EU OJ L 101, 20.04.2018).

12.7. Other adverse effects

Alkaline substance. Unintentional release of a significant amount of the substance into the aquatic environment may cause a localized pH change that is harmful to organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

When disposing of waste, comply with Community Legislation:

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (EU OJ L 312/3 of 22.11.2008 as amended)

European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste (EU OJ L 365/10 of 31.12.1994 as amended)

How to dispose of the product: Do not introduce into the environment. If recovery and return for use is not possible, dispose of the waste product in properly labeled containers to an authorized company.

How to dispose of packaging: Do not introduce into the environment. Dispose of contaminated packaging as you would a product; transfer in properly labeled containers to an authorized company.

SECTION 14: Transport information

14.1. UN number or ID number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

It is not a hazardous material according to RID and ADR regulations.

14.5. Environmental hazards

The substance is not hazardous to the environment according to the criteria of the UN Model Regulations.

14.6. Special precautions for user

Alkaline substance. In case of unintentional release, collect mechanically using the individual protective equipment described in Section 8.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

Safety, health, and environmental regulations/legislation specific for the substance or mixture

- **Regulation (EC) No 1907/2006** of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, as amended.
- **Regulation (EC) No 1272/2008** of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 as amended.
- **Commission Regulation (EU) 2020/878** of June 18, 2020, amending Annex II to Regulation (EC) No. 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).
- **Directive 2008/68/EC** of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods as amended.

15.1. Chemical safety assessment

The chemical safety of the product has been evaluated.

SECTION 16: Other information

Key to abbreviations and acronyms:

DNEL - Derived no-effect level
DSB - concentration in biological material
EC_{50} - Half maximal effective concentration

IMO - International Maritime Organization
IMSBC - International Maritime Solid Bulk Cargoes
LC_{50} - the concentration at which death is observed in 50% of the test organisms
LD_{50} - the dose at which death is observed in 50% of the test organisms
b.w. - body weight
NOAEL - no observable adverse effect level
CAS No. - the number assigned to a chemical substance by the Chemical Abstracts Service
Index number - the number assigned to the chemical substance in Annex VI of the CLP Regulation
EC No. - the number assigned to the chemical in the European Inventory of Existing Commercial Chemical Substances (EINECS), the European List of Notified Chemical Substances (ELINCS), or the list of chemicals listed in the European Commission publication "No-longer polymers" (NLP)
PBT - persistent, bioaccumulative and toxic substance
PNEC - predicted no-effect concentration in the environment

vPvB - very persistent and very bioaccumulative substance
TWA – 8 hours' time-weighted average
BLV – Biological limit values

Key Data Sources:
REACH registration dossier of the substance silcic acid, potassium salt.

Training advice: Before use read the SDS.

The information contained in this document is based on the current state of our knowledge and is intended to describe the product from the perspective of safety requirements. They cannot be interpreted as a guarantee of product properties. The consignee and user are responsible for ensuring a safe workplace and conditions for the safe use of the product, and for complying with all applicable laws.

The safety data sheet cancels and replaces all its previous editions.
Changes made to the previous edition – section 1.