

Characteristics Card of a Substance

The card is conforming to the Regulation (EC) no. 1907/2006 of the European Parliament and Council dated on 18 December, 2006

1. IDENTIFICATION OF SUBSTANCE AND IDENTIFICATION OF COMPANY

1.1. Product identifier

Name and identification number: **Silicic acid; potassium salt; MR >3.2; lumps**
CAS number: **1312-76-1**
CE number: **215-199-1**
REACH registration number: **01-2119456888-17-0005**
Index number: **none**
EC name: **silicic acid; potassium salt**
CAS name: **silicic acid; potassium salt**
Other names: **potassium glaze MR >3.2;
Potassium silicate MR >3.2.**

Note: there are produced potassium silicates of various molar ratios (MR) defined as molar ratio of SiO₂ to K₂O in a substance present in solid form (lumps or powder) or in liquid form. MR and state of aggregation influence in a significant way the classification and labelling.

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

Significant uses: production of potassium water glass; silicate production, production and application of the liquid and solid fabrics laundry detergent, dishwashing, industrial cleaning agents and disinfectants, adhesives and binders in a variety of industries: paper, ceramics, construction materials and refractories, foundry, plastic insulation, anti-dusting and burning, production of paints, including anti-corrosion paint, plaster, impregnates, stabilizers, viscosity regulators.

Uses advised against not identified.

1.3. Data concerning the card supplier

CIECH Vitrosilicon SA
(68-120) IŁOWA, ul. Żagańska 27
tel. +48 68- 3600747, 3600777; fax: +48 68- 3600700;
e-mail: ciechvitrosilicon@ciechgroup.com

1.4. Emergency phone number

Producer's phone active within 7.00 a.m. to 4.00 p.m.: **+48 68- 360 07 47, 360 07 77**
Toxic Information Office in Warsaw: **+48 22- 619 08 97**

2. IDENTIFICATION OF HAZARDS

2.1. Classification of hazards

2.1.1. Classification conforming to the regulation (EC) 1272/2008 [CLP/GHS]

– Substance not classified

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2.1.2. Classification conforming to the DSD directive and the decree of the Minister of Health in the matter of criteria and the way of classifying chemical substances and mixtures (Dz.U.12.1018)

- Substance not classified

2.2. Elements of labelling

2.2.1. Labelling conforming to the regulation (CE) No 1272/2008 [CLP/GHS]

- Substance does not require labelling

2.2.2. Labelling according to the DSD directive and the decree of the Minister of Health in the matter of labelling packages of dangerous substances and dangerous mixtures and some chemical mixtures (Dz.U.12.445)

- Substance does not require labelling

2.1. Other hazards

Substance does not meet PBT or vPvB criteria under annex XIII of REACH regulation.

3. COMPOSITION / INFORMATION ON COMPONENTS

Chemical name:	silicic acid, potassium salt of MR module >3.2
Pure substance content:	99%ww (K₂O+SiO₂)
Customary name:	potassium glaze MR >3.2
EC name:	silicic acid, potassium salt; Nr WE: 215-199-1
CAS name:	silicic acid, potassium salt; nr CAS: 1312-76-1
IUPAC name:	potassium hydroxy(oxo)silanolate
Chemical formula:	K₂O x nSiO₂

Description of substance: Inorganic substance UVCB type. It is a composition of silicate anions oligomers SiO₄ connected with potassium cations. Structural composition of the substance and its characteristics depend on molar ratio of SiO₂ to K₂O called the molar module MR. Described product (for concentration 100% of K₂O x nSiO₂) of MR > 3.2 contains:

Molar module (MR)	SiO ₂ content	K ₂ O content
> 3.2	> 67%	< 33%

Description of impurities: present, in the amount of less than 1%ww, impurities do not influence classification of the substance. They are metal oxides coming from raw materials (quartz sand) e.g. oxides of: calcium, magnesium, aluminium, titanium, iron, etc. as well as KCl and K₂SO₄.

4. FIRST AID MEANS

4.1. Description of first aid means

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The substance is not dangerous to humans. One should avoid contact with uncovered skin or eyes.

In case of contact with skin: wash the skin away with running water or under shower.

In case of the substance coming into eyes: remove mechanically; wash carefully with water for at least 10 minutes. Take contact lenses out, if they are and it is easy to remove them. Call a doctor – an ophthalmologist.

In case of swallowing: wash the mouth, do not cause vomiting.

After inhaling: in case of not feeling well, take the sufferer outside.

4.2. The most important acute and delayed signs and effects of exposure

Solid substance, poorly soluble in water. A layer of soluble alkaline K_2CO_3 may form on the surface as a result of contact with CO_2 from air. Contact with skin may cause harmless irritation. Accidental bringing the substance into eye may cause irritation. Swallowing may cause injury to mucosa.

4.3. Indications referring to any immediate medical help and special procedure with the sufferer

In case of the substance getting into eyes and continuous eye irritation or redness after washing with a lot of water, call a doctor – an ophthalmologist.

Every time, in case of using medical help, it is recommended to present this characteristics card to the person giving help.

5. PROCEDURE IN CASE OF FIRE

5.1. Extinguishing media

Incombustible substance and not sustaining burning. In case of fire adjust extinguishing media to materials stored in the immediate neighbourhood. Lack of data on not recommended extinguishing media.

5.2. Special risks connected with the substance

Solid substance, incombustible, inexplosive.

Reacts with solutions of mineral acids and with concentrated hydrofluoric acid.

5.3. Information for fire brigade

Avoid direct contact with uncovered skin and eyes. Substance poorly dissolving in water, alkaline. Avoid getting the substance and fire waste into surface and ground waters.

6. PROCEDURE IN CASE OF UNINTENTIONAL RELEASE TO ENVIRONMENT

6.1. Individual precautions, protective equipment and procedures in emergency

Avoid contact with skin and eyes. Wear protective clothing of general use and rubber gloves. Take off contaminated clothes and wash before next use.

6.2. Precautions within the scope of environment protection

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Do not allow the substance to get into sewage system, surface and ground waters, water tanks and courses.

6.3. Methods and materials preventing the spread of contamination and used for removing contamination

Collect mechanically the product released to environment, recycle to process or transfer to utilization. Avoid contact with acids.

6.4. Reference to other sections

Apply control and individual protection means described in section 8 of this card. Deal with the released material according to the principles described in section 13.

7. PROCEDURE WITH THE SUBSTANCE AND ITS STORAGE

7.1. Precautions referring to safe procedure

Store in a dry place. Avoid contact with uncovered skin and eyes. Act according to general occupational safety and health rules with chemicals, rules of good industrial practice and producer's recommendations. If there is a need to manipulate the substance, apply personal protection means according the principles described in section 8 of this card.

Do not eat, drink or smoke during work with the substance, except for places assigned for this; wash hands before breaks and after finishing work.

7.2. Conditions of safe storage together with information referring to any mutual incompatibility

Store loose or in containers on roofed, hardened storage yards. Do not store in containers made of or covered with zinc or aluminium. Do not store close to acid.

7.3. Special final use(s)

The substance is not used in mixtures/preparations assigned for consumers.

8. EXPOSURE CONTROL / INDIVIDUAL PROTECTION MEANS

8.1. Control parameters

There is no common NDS value determined for the substance. The substance not mentioned in the decree of the Minister of Labour and Social Politics in the matter of the highest permissible concentrations and intensity of factors harmful to health in work environment (Dz.U.02.217.1833).

In REACH registration documentation **DNEL** (derived no-effect level) value was determined according to the tables below.

For workers employed in processes of manufacturing and processing, where the substance concentration in the product or mixture exceeds 25%

Effect	Exposure route	DNEL
Long-term general effect	Via skin	1.49 mg/kg bw/d
	Via respiratory system	5.61 mg/m ³
Long-term local effect	Via skin	No application

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	Via respiratory system	No application
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Workers may be exposed to potassium silicate during manufacturing, processing and filling in containers. For workers, DNEL level was determined, for long-term exposure via inhalation (5.61) and through skin (1.49).

OEL (Occupational exposure level) levels were determined: 3mg/m³ (alveolar fraction) and 10mg/m³ (respirable fraction) for absorption via respiratory system. Exceeding the determined doses for potassium silicate of MR>3.2 in a form of solution is of low probability.

Product in the form of lumps does not appear in consumer's market.

PNEC (Predicted No Effect Concentration) values were determined for the substance:

- for aquatic environment – fresh water: 7.5mg/L
- for aquatic environment – sea water: 1.0mg/L
- for discontinuous release to water: 7.5mg/L
- for sludge: 348.0mg/L

For the other components of the environment, the PNEC values were not determined because of the very small, impossible to assess risk to the environment.

8.2. Exposure control

8.2.1. Applied technical means of control

In conditions of production or processing, to prevent inhalation absorption of the substance occurring as dust e.g. in transport, at reloading or at processing, local exhaust ventilation should be used wherever possible.

If the substance is produced or processed outside rooms or tightly closed systems – ensure individual respiratory system, skin and eyes protection means.

8.2.2. Individual protection means, individual safety equipment

In the processes of producing and processing, wholly or partly air-tight sealed, use protective clothing of general appropriation and strengthened drill gloves rubber gloves (natural rubber or with the additive of polychloroprene) according to PN-EN 420+A1:2010.

In the processes of producing and processing outside hermetic systems, one should use masks or half-masks with anti-dust filter according to standard PN-EN 149+A1:2010 and gloves.

8.3.3. Environment exposure control

Solid substance in the form of lumps does not cause significant risks to the environment. Collect the spilled product mechanically or by hand and recycle to process.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on physical and chemical properties

Appearance	Solid in the form of lumps. Vitreous body, transparent of blue-green or yellow-brown colour.
Smell	Scentless
Odour threshold	Smell is imperceptible
pH	Product very poorly soluble in water, after dissolving, for 4% solution of temperature 20°C, pH=10-12
Melting / freezing point	Because of non-crystalline character, solid potassium silicate does not have distinct melting point. Potassium silicate in lumps starts softening above 700°C, reaching flow temperature about 900°C (905°C flow point)
Starting boiling point Scope of boiling point	For pure substance this value is not determined as pure potassium silicate melts in temperature above 300°C
Ignition temperature	Study is not necessary – inorganic substance
Evaporation rate	For pure substance - study is not necessary – substance melts in temperature above 300°C
Flammability	Incombustible substance
Upper and lower combustibility limit or upper/lower explosive limit	Study is not necessary – incombustible substance
Vapour pressure	For pure substance – below 0.0103kPa (1175°C)
Vapour density	For pure substance - study is not necessary – substance melts in temperature above 300°C
Relative density (specific gravity)	Bulk density changes depending on size and size reduction of lumps. Average bulk density is about 1.4g/cm ³ .
Solubility	Product poorly soluble in water. Quantitative determination in [g/cm ³ in 20°C] is impossible. Solubility decreases with the increase of molar module MR. Product soluble in most organic dissolvents.
Partition coefficient	Study is not necessary – inorganic substance
Spontaneous ignition temperature	Study is not necessary – inorganic substance
Breakdown temperature	Lack of data – substance does not decompose in temperatures below 1400°C
Viscosity	Not applicable – solid substance.
Explosive properties	Study is not necessary – inorganic substance
Oxidizing properties	Substance has no oxidizing properties

9.1. Other information

Lack of other significant information.

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10. STABILITY AND REACTIVITY

10.1. Reactivity

Substance of alkaline reaction, in normal conditions very poorly soluble in water. On the surface reacts with anhydride of carbonic acid, creating K_2CO_3 . May react with acid vapours.

10.2. Chemical stability

Stable substance in normal use conditions and in predictable storage conditions.

10.3. Possibility of occurring dangerous reactions

Emitting a certain amount of heat accompanies reaction with acids. Emitting dangerous gases accompanies reaction with hydrofluoric acid.

10.4. Conditions that should be avoided

Avoid contact with water, steam, dusting.

10.5. Incompatible materials

One should avoid: acid solutions and vapours, materials made of or covered with zinc, aluminium, tin, lead or their alloys.

10.6. Dangerous decomposition products

In normal conditions the substance does not decompose.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

11.1.1. Acute toxicity

Orally: LD50 (rat) > 5000mg/kg bw

Inhalation: LC50 (rat) > 2.06 g/m³

After application on skin: LD50 (rat) > 5000mg/kg bw

Toxicity decreases with the increase of molar module MR.

- Substance does not present any acute toxic effect at any way of exposure.

11.1.2. Caustic / irritating effects on skin

Studies of potassium silicate effects have shown: no irritating effect to slightly irritating effect depending on molar module MR. With the increase of molar module MR, irritating effect decreases.

- No basis for classification of the substance in respect of irritating effect.

11.1.3. Serious injury to eyes / irritating effects on eyes

Lack of study results for people. At the concentration of potassium silicate in solutions up to 35% for molar modules 2.47; 3.4 and 3.9 only slight irritating effect on eye or lack of irritating effect was found (a rabbit).

- No basis for classification of the substance in respect of irritating effect on eyes.

11.1.4. Allergenic effect to respiratory system or skin

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The assessment of allergenic effect was based on available study results, which presented no allergenic effect to skin or respiratory system. Sporadically occurring hives is of individual character.

- The substance is not an allergenic substance.

11.1.5. Mutagenic effect on reproductive cells

Available study results present lack of negative mutagenic effect on reproductive cells.

- The substance has no mutagenic effect on reproductive cells.

11.1.6. Carcinogenicity

Lack of data (study results) presenting carcinogenic effect of potassium silicates in the form of lumps.

11.1.7. Harmful effect on reproductiveness

Harmful effect of the substance on reproductiveness, including: influence on reproductive functions and fertility and adverse influence on progeny development was assessed on the basis of available studies on animals, from which it results that:

- The substance is not harmful for reproductiveness and progeny.

11.1.8. Toxic effects on target organs – single exposure

On the basis of available study results for the substance, no toxicity to target organs was found.

- No basis for classification of the substance.

11.1.9. Toxic effects on target organs – repeated exposure

On the basis of available long-term study results for the substance as a solid, no toxicity to target organs was found.

- No basis for classification of the substance.
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12. ECOLOGICAL INFORMATION

12.1. Toxicity

Soluble silicates are indistinguishable from natural forms of silicates, which consist 59% of the earth's crust, they get into waters as a result of natural geochemical processes. Soluble silicates getting into waters as a result of production and processing have no anthropogenic significance.

On the basis of available study results, for calculation of PNEC levels it is accepted, that:

- Acute toxicity to fish: LC50 (48h) >146mg/L (Leuciscus idus)
- Long-term toxicity to fish: NOEC no possibility to determine
- Long-term toxicity to invertebrates / toxicity to algae and cyanobacteria:
EC50 72h, biomass): 207mg/L (Scenedesmus subspicatus)
EC50 (72h, growth rate): >345.4mg/L (Scenedesmus subspicatus).
- Toxicity to sea microorganisms:
EC0 (18h) >10000mg/L (pH 7.6-7.8), equivalent to >3480mg active sample/L
(Pseudomonas putida)
EC0 (18h) >1000mg/L (pH>9), equivalent to >348mg active sample/L
(Pseudomonas putida)
EC0 (30 minutes, inhibition, oxygen) 3454mg/L

Hazard to water environment is insufficient for classifying the substance.

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Because of physical-chemical properties (very low vapour pressure) release to atmosphere during use of the substance is not possible.

The substance shows no harmfulness for soil organisms, bees, birds and mammals.

12.2. Stability and decomposition capacity

12.2.1. Abiotic degradation

Soluble potassium silicates are subject to hydrolysis in water. In normal conditions at pH>10.6 they are stable. Together with the increase of molar module MR, increases the share of Si-O-Si and decreases chemical activity, increases resistance to abiotic decomposition. The substance of MR≥3.3 module is little active in environment, it is resistant to photodegradation in air and soil.

12.2.2. Biotic degradation

Inorganic substance – is not subject to decomposition under the influence of biotic factors.

12.3. Ability for bioaccumulation

The substance presents low potential of bioaccumulation – confirmed by toxicokinetic studies results on vertebrates.

12.4. Mobility in soli

Inorganic substance – is not subject to biodegradation in soil.

12.5. Results of PBT and vPvB properties assessment

The substance does not present characteristics of a PBT and vPvB substance.

12.6. Other harmful effects

There are no other known harmful effects of the substance for environment.

13. PROCEDURE WITH WASTE

13.1. Methods of waste treatment

In the process of making potassium silicate solutions, little amounts of waste are created. If recovery and recycling for use are not possible, waste substance should be collected to a marked container, recycle to process or transfer to utilization to specialized companies.

In case of accidental spilling the substance, collect, applying safety rules described in section 8, recycle to process or transfer to neutralization.

14. INFORMATION ON TRANSPORT

14.1. UN number	none
14.2. Correct UN transport name	none
14.3. Class(es) of risk in transport	is not a dangerous material according to RID and ADR regulations

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- 14.4. Package group** none
- 14.5. Hazard to environment** does not occur
- 14.6. Special precautions for users**
Alkaline substance. In case of accidental release collect mechanically or by hand, using personal protection means mentioned in section 8.
- 14.7. Loose transport according to annex II to MARPOL 73/78 convention and IBC codes**
Substance not mentioned in annex II to MARPOL 73/78 convention and not included in IBC codes.

15. INFORMATION ON LEGAL REGULATIONS

15.1. Legal regulations referring to safety, health and environment protection specific for the substance and mixture

European Union law

- Decree (EC) 1907/2006 of the European Parliament and Council dated on December 18, 2006 in the matter of registration, assessment, granting permissions and applied restrictions within the scope of chemicals (REACH)...
- Decree of the European Parliament and Council (EC) No. 1272/2008 dated on December 16, 2008 in the matter of classification, labelling and packing substances and mixtures
- Decree of the Commission (EU) No. 453/2010 dated on May 20, 2010 in the matter of registration, assessment, granting permissions and applied restrictions within the scope of chemicals (REACH).

Polish law

- Act dated on February 25, 2011 about chemical substances and mixtures – Dz.U.11.63.322, as amended
- Act dated on December 14, 2012. waste - Dz. U.13.21
- Act dated on June 13, 2013 about packages and package waste – Dz.U.2012.888.
- Decree of the Minister of Environment dated on September 27, 2001 in the matter of packages catalogue – Dz.U.01.112.1206
- Decree of the Minister of Health dated on August 10, 2012 in the matter of criteria and way of chemical substances and mixtures classification – Dz.U.12.1018 as amended.
- Decree of the Minister of Health dated on May 22, 2012 in the matter of way of labelling places, pipelines and containers and tanks for storing or containing dangerous substances or dangerous mixtures - Dz.U. Dz.U.12.601
- Decree of the Minister of Health dated on December 30, 2004 in the matter of occupational safety and health connected with chemical factors occurring in a work place – Dz.U.05.11.86 as amended
- Decree of the Minister of Health dated on July 6, 2014 in the matter of highest allowable concentrations and intensity of factors harmful for work environment – Dz.U.14.817 as amended
- Decree of the Minister of Economy dated on December 21, 2005 in the matter of basic requirements for individual protection means – Dz.U.05.259.2173.

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- Act dated on August 19, 2011 about road transport of dangerous materials - Dz.U.11.227.1367 as amended.
- Decree of the Minister of Health dated on April 20, 2012 in the matter of labelling of chemical substances and mixtures, and mixtures- Dz.U.12.445.

15.2. Chemical safety assessment

Chemical Safety Report for substances was worked out. The report is part of registration documentation submitted to ECHA. The report refers the process of the substance production and its identified applications.

16. OTHER INFORMATION

The present characteristics card was worked out on the basis of registration documentation REACH of the substance silicic acid, potassium salt nr 01-2119456888-17-0005, prepared by Cognis GmbH on order of consortium Soluble Silicates Consortium – producer of soluble silicates and on the basis of the producer's data.

Classified substance: silicic acid, potassium salt, lumps, MR> 3.2

CAS number: 1312-76-1

EINECS number: 215-199-1

Classification and labelling according to CLP/GHS

- Substance not classified

Classification and marking according to DSD and decree of the Minister of Health (Dz.U.12.1018)

- Substance not classified

The present card is the property of CIECH Vitrosilicon S.A. (68-100) Ilowa Poland and characterises only the products marked with our mark and company name.
