SAFETY DATA SHEET

SODIUM METASILICATE NONAHYDRATE

This document complies with the European Regulation (EC) No. 1907/2006 (REACH), as amended by regulation (EC) No 453/2010.

Issue Number : 13
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1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name : Sodium metasilicate nonahydrate granules
Chemical name(s) : Disodium metasilicate nonahydrate, Disodium trioxosilicate
Formula : $Na_2SiO_3.9H_2O$
CAS-nr. : 13517-24-3
EC-nr. : 229-912-9
REACH registration nr. : 01-2119449811-37-0004

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

Identified use(s): Industrial uses
Consumer uses
Professional uses

Uses advised against: None known

1.3. Details of the supplier of the safety data sheet

Adress: SILMACO NV
Industrieweg 90
B-3620 Lanaken
Belgium
Telephone: +32 (0)89/730 222
Fax: +32 (0)89/722 724
Email: info@silmaco.com

1.4. Emergency telephone number

SILMACO : +32 (0)89/730 222 (only during office hours)
Poison Center : +32 (0)70/245 245 (24/24h)

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

GHS Classification according to EC 1272/2008:

Hazard classes/categories	Hazard Statements
Metal Corr. 1	H290: May be corrosive to metals.
Skin Corr. 1B / Eye Dam. 1	H314: Causes severe skin burns and eye damage.
STOT SE 3	H335: May cause respiratory irritation

Hazards summary: Strongly alkaline. Causes burns.
Irritating to respiratory system.
May cause permanent damage to eyes.

2.2. Label elements (according to EC 1272/2008)

Hazard pictogram(s) :

Signal word(s):	Danger
Hazard statement(s):	H290: May be corrosive to metals. H314: Causes severe skin burns and eye damage. H335: May cause respiratory irritation
Precautionary statement(s): dust/fume/gas/mist/vapours/spray.	P261: Avoid breathing P262: Do not get in eyes, on skin, or on clothing. P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting. P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Ingredient(s)	%WW	EC-nr.	REACH registration nr.	GHS-classification according to EC 1272/2008
Disodium metasilicate nonahydrate	100	229-912-9	01-2119449811-37-0004	Metal Corr. 1 – H290 Skin Corr. 1B/Eye Dam. 1 – H314 STOT SE 3 – H335

4. FIRST AID MEASURES

4.1. Description of first aid measures

After eye contact: Immediately flush eyes with eyewash solution or water (for 10 minutes). See an oculist.

After skin contact: Rinse with running water and soap. Apply replenishing cream. Change all contaminated clothing.

After inhalation: After inhalation of dust: seek medical advice.

After ingestion: Rinse mouth and throat. Drink 1-2 glasses of water. Seek medical advice.

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

⇒ Strongly alkaline. Causes burns.
⇒ Irritating to respiratory system.
⇒ May cause permanent damage to eyes.

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

Obtain immediate medical attention.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable extinguishing media: Not applicable. Inorganic material. Non-combustible, therefore define extinguishing measures according to neighbouring conditions.

Unsuitable extinguishing media: Not applicable.

5.2. Special hazards arising from the substance or mixture

Not applicable. Inorganic material. Non-combustible.

5.3. Advice for firefighters

No particular measures required.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

⇒ Avoid contact with skin and eyes, do not breath dust.
⇒ Wear suitable protective clothing. Wear eye/face protection. An approved dust mask should be worn if dust is generated during handling.
⇒ Danger of slipping on spilled product.

6.2. Environmental precautions

⇒ Do not allow to enter drains / surface water / ground water. Prevent the spreading of the product into the environment by diking with soil or other absorbent material
⇒ Contact the authorities in the event of large product spillage to water courses or sewage systems or if spillage has contaminated soil.

6.3. Methods and materials for containment and cleaning up

⇒ Collect as much as possible in a (clean) container for recovery or disposal.
⇒ Remove last traces by diluting with plenty of (warm) water

6.4. Reference to other sections

See also section 8

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

⇒ Avoid creation of dust, do not breath dust.
⇒ Avoid contact with eyes, skin and clothing.
⇒ Wear protective equipment, see also section 8.
⇒ Eye wash facilities should be readily available.

7.2. Conditions for safe storage, including any incompatibilities

⇒ Keep packaging / storage vessel closed and dry
⇒ Protect packaging from freezing, rain or direct sun
⇒ Keep away from acids
⇒ Compatible materials : (Stainless) steel
⇒ Incompatible materials : Zinc, Tin, Aluminum, Cupper and their alloys
⇒ See also title 10

7.3. Specific end use(s)

None known

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Substance	Occupational exposure limits
Disodium metasilicate	The derived DNEL for inhalation is higher than the existing OEL for dust, therefore long-term systemic effects caused by disodium metasilicate are not expected to occur as long as the OEL is complied with. The existing OEL (TRGS 900, June 2008) for dust is 3 mg/m^3 (alveolar fraction) and 10 mg/m^3 (respirable fraction).

Derived No Effect Level (DNEL)	Oral / mg/kg bw/d	Inhalation / mg/m3	Dermal mg/kg bw/d
Workers – Long Term – Systemic effects	-	6,22	1,49
Consumers – Long Term – Systemic effects	0,74	1,55	0,74

Predicted No Effect Concentration (PNEC)	mg/L
Fresh water	7,5
Marine water	1
Intermittent water	7,5
Sewage treatment plant	1000

8.2. Exposure controls

8.2.1. Engineering controls

Engineering methods to prevent or control exposure are preferred. Methods include process or personal enclosure, mechanical ventilation (dilution and local exhaust) and control of process conditions.

8.2.2. Personal protection

Respiratory protection: Avoid inhalation of dusts. Wear suitable respiratory protective equipment conforming to EN140 with type A/P2 filter or better if working in confined spaces with inadequate ventilation.

Eye/face protection: Wear suitable tightly fitting goggles.

Skin protection: Wear suitable protective clothing and alkaline resistant gloves (PVC, rubber or natural latex) tested according to EN 374.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

⇒ Appearance	white granules
⇒ Odour ...	odourless
⇒ Odour threshold (ppm)	not applicable
⇒ pH (value)	> 12,0 (1% solution)
⇒ Melting/freezing point (°C)	± 48 °C
⇒ Boiling point/ range (°C)	not applicable
⇒ Flash point (°C)	not applicable
⇒ Evaporation rate	not applicable
⇒ Flammability (solid, gas)	not applicable
⇒ Explosive limit ranges	not applicable
⇒ Vapor pressure (mm Hg)	not applicable
⇒ Vapor density (air=1)	not applicable
⇒ Bulk density (kg/l)	0,80 – 1,10 kg/l
⇒ Solubility (water)	soluble
⇒ Solubility (other)	no data
⇒ Partition coefficient	not applicable
⇒ Auto ignition temperature (°C)	not applicable
⇒ Decomposition temperature (°C)	not applicable

⇒ Viscosity (mPa.s) not applicable
⇒ Explosive properties not applicable
⇒ Oxidising properties not applicable

9.1. Other information

No data

10. STABILITY AND REACTIVITY

10.1. Reactivity

See section 10.3.

10.2. Chemical stability

Stable under recommended storage and handling conditions

10.3. Possibility of hazardous reactions

⇒ Aqueous solutions will react with aluminium, zinc, tin, cuppur and their alloys evolving hydrogen gas which can form an explosive mixture with air.
⇒ Exothermic reaction if in contact with acids

10.4. Conditions to avoid

Avoid prolonged contact with ambient air : hygroscopic behaviour may induce formation of lumps.
Avoid contact with concentrated acids.

10.5. Incompatible materials

Avoid contact with aluminum, zinc, tin, cupper and their alloys

10.6. Hazardous decomposition products

None known

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

All symptons of acute toxicity are due to high alkalinity.

⇒ **Ingestion:** Material will cause chemical burns. Oral LD50 (rat): 1152-1349 mg/kg bw
⇒ **Inhalation:** Dust is severely irritant to the respiratory tract. Inhalation LC50 (rat) > 2,06 g/m3
⇒ **Skin contact:** Material will cause chemical burns. Dermal LD50 (rat) > 5000 mg/kg bw.
⇒ **Eye contact:** Material will cause chemical burns. May cause permanent damage if eye is not immediately irrigated.

Skin corrosion/irritation:	Corrosive to skin.
Serious eye damage/irritation:	Corrosive to eyes.
Sensitisation:	Not sensitising (LLNA).
Mutagenicity:	No evidence of genotoxicity. In vitro/in vivo negative.
Carcinogenicity:	No structural alerts.
Reproductive toxicity:	Effects on fertility: NOAEL (rat) > 159 mg/kg bw/d. Developmental toxicity: NOAEL (mouse) > 200 mg/kg bw/d.
STOT-single exposure:	Irritating to respiratory system.
STOT-repeated exposure:	NOAEL oral (rat): 227 mg/kg bw/d NOAEL oral (mouse): 260 mg/kg bw/d
Aspiration hazard:	Not classified.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

⇒ Acute fish toxicity (Brachydanio rerio): LC50 (96 hour): 210 mg/l
⇒ Acute invertebrates toxicity (Daphnia magna): EC50 (48 hour): 1700 mg/l
⇒ Algae / cyanobacteria (Scenedesmus subspicatus): EC50 (72 h, biomass): 207 mg/L, EC50 (72 h, growth rate): > 345.4 mg/L

12.2. Persistence and degradability

Inorganic. Soluble silicates, upon dilution, rapidly depolymerise into molecular species indistinguishable from natural dissolved silica. They combine with ions like Ca, Mg, Fe, Al and others to end up as insoluble compounds similar to constituents of natural soils.

12.3. Bioaccumulative potential

Inorganic. The substance has no potential for bioaccumulation.

12.4. Mobility in soil

Not applicable.

12.5. Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6. Other adverse effects

The alkalinity of this material will have a local effect on ecosystems sensitive to changes in pH.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

⇒ Waste disposal according national or regional regulations, neutralisation prior to disposal is advisory
⇒ Dispose contaminated packaging according national or regional regulations, preliminary cleaning with water is advisory
⇒ EWC (European Waste Catalog) -number : 06 02 99

14. TRANSPORT INFORMATION

14.1. UN number	3253
14.2. UN proper shipping name	Disodium trioxosilicate
14.3. Transport hazard class(es)	8
14.4. Packing Group	III
14.5. Environmental hazards	Not classified as a marine pollutant
14.6. Special precautions for user	See title 7.2. for incompatible materials
14.7. Transport in bulk according to annex II of MARPOL73/78 and the IBC Code	Not applicable

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislations specific for the substance or mixture.

⇒ **TSCA inventory status:** reported/included
⇒ **AICS inventory status:** reported/included
⇒ **DSL/NDSL inventory status:** reported/included

15.2. Chemical safety assessment

A chemical safety assessment has been conducted. The results are summarized in annex. The annex covers workplace and consumer exposure scenario's.

16. OTHER INFORMATION

The following sections contain revisions or new statements:

- Section 2.1.: removed DSD-Classification
- Section 8.1.: addition of DNEL and PNEC values
- Annex: update of the exposure scenario's

Sources of key data: IUCLID and CSR disodium metasilicate

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ANNEX TO SAFETY DATASHEET

Section 1	**Exposure Scenario Title**
Title	Workplace exposure to disodium metasilicate (EC 229-912-9) powders
Use Descriptor	Sector of Use (SU) 3 and 22 (including the supplementary SU´s 2a, 2b, 4, 5, 6b, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23)
	Process Categories (PROC): 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 11, 13, 14, 15, 17, 19, 21, 22, 23, 24, 25, 26
	Environmental Release Categories (ERC): 1, 2, 3, 4, 5, 6b, 6d, 7, 8a, 8b, 8c, 8d, 8f
Processes, tasks, activities covered	Manufacture and formulation of the substance as well as industrial and professional uses.
Section 2	**Operational conditions and risk management measures**
	If possible, local exhaust ventilation should be used. In addition, whenever disodium metasilicate as a substance on its own or in a preparation is handled outside closed systems, suitable personal protective equipment (gloves, goggles, dust masks or respirators) is the preferred and only measure of control.
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	solid, powder, vapour pressure 1.03 Pa (1175 °C)
Concentration of substance in product	Covers percentage substance in the product up to 100 %, unless otherwise stated.
Amounts used	No limit
Frequency and duration of use	Covers frequency up to: daily use, weekly, monthly, yearly, unless otherwise stated.
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. The work occurs inside as well outside.
Contributing Scenarios	**Risk Management Measures.**
PROC 1, 2, 3	Handle substance within a closed system. No other specific measures identified.
PROC 4, 5, 6, 8a, 8b, 9, 10, 13, 14, 15, 17, 19, 21, 22, 23, 24, 25, 26	Wear suitable gloves (tested to EN374) and eye protection.
PROC 7, 11	Provide enhanced general ventilation by mechanical means. Wear suitable gloves (tested to EN374) and eye protection. or Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374) and eye protection.
Section 2.2	**Control of environmental exposure**
	Not required, as soluble silicates including disodium metasilicate do not meet the criteria for classification as dangerous to the environment according to 67/548/EEC (See Article 14.4 of REACH Regulation). Furthermore, as high production volume substances, soluble silicates have been reviewed to a great extent for their exposure potential to the environment and the possible risks arising from their release (Van Dokkum et al. 2002, OECD SIDS 2004, HERA 2005, and CEES 2008). It was concluded that soluble silicates are currently of low priority for further work because of their low hazard profile.
Section 3	**Exposure Estimation**
3.1.	**Health**
When the recommended risk management measures (RMM) and operational conditions (OC) including personal protective equipment (PPE) are used, the exposure to powders of disodium metasilicate will be negligible. RMMs are based on a qualitative risk characterization.	

Section 4	Guidance to check compliance with the Exposure Scenario
4.1.	Health
The implemented RMMs and OCs including PPE will ensure that workers´ exposure is reduced in a way that health hazard effects are avoided and that the risk is considered to be adequately controlled.	

Section 1	Exposure Scenario Title
Title	Workplace exposure to disodium metasilicate (EC 229-912-9) solutions
Use Descriptor	Sector of Use (SU) 3 and 22 (including the supplementary SU´s 4, 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20)
	Process Categories (PROC): 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 11, 13, 14, 15, 17, 19, 20, 21, 22, 23, 24, 25
	Environmental Release Categories (ERC): 1, 2, 3, 4, 5, 6b, 6d, 7, 8a, 8c, 8d, 8f, 9a, 9b
Processes, tasks, activities covered	Manufacture and formulation of the substance as well as industrial and professional uses.
Section 2	**Operational conditions and risk management measures**
	If possible, local exhaust ventilation should be used. In addition, whenever disodium metasilicate as a substance on its own or in a preparation is handled outside closed systems, suitable personal protective equipment (gloves, goggles, dust masks or respirators) is the preferred and only measure of control.
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	liquid, solution, vapour pressure 1.03 Pa (1175 °C)
Concentration of substance in product	Covers percentage substance in the product up to 100 %, unless otherwise stated.
Amounts used	No limit
Frequency and duration of use	Covers frequency up to: daily use, weekly, monthly, yearly
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. The work occurs inside as well outside.
Contributing Scenarios	**Risk Management Measures.**
PROC 1, 2, 3	Handle substance within a closed system. No other specific measures identified.
PROC 4, 5, 6, 8a, 8b, 9, 10, 13, 14, 15, 17, 19, 20, 21, 22, 23, 24, 25	Wear suitable gloves (tested to EN374) and eye protection.
PROC 7, 11	Provide enhanced general ventilation by mechanical means [E48]. Wear suitable gloves (tested to EN374) and eye protection. or Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374) and eye protection.
Section 2.2	**Control of environmental exposure**
	Not required, as soluble silicates including disodium metasilicate do not meet the criteria for classification as dangerous to the environment according to 67/548/EEC (See Article 14.4 of REACH Regulation). Furthermore, as high production volume substances, soluble silicates have been reviewed to a great extent for their exposure potential to the environment and the possible risks arising from their release (Van Dokkum et al. 2002, OECD SIDS 2004, HERA 2005, and CEES 2008). It was concluded that soluble silicates are currently of low priority for further work because of their low hazard profile.
Section 3	**Exposure Estimation**
3.1.	**Health**
When the recommended risk management measures (RMM) and operational conditions (OC) including personal protective equipment (PPE) are used, the exposure to aqueous solutions of disodium metasilicate will be negligible. RMMs are based on a qualitative risk characterization.	

Section 4	Guidance to check compliance with the Exposure Scenario
4.1.	Health
The implemented RMMs and OCs including PPE will ensure that workers´ exposure is reduced in a way that health hazard effects are avoided and that the risk is considered to be adequately controlled.	

Section 1 Exposure Scenario Title		
Title		
Use in Consumer products		
Use Descriptor		
Sector(s) of Use (SU)	21	
Product Categories (PC)	1, 3, 8, 9a, 9b, 9c, 15, 16, 17, 31, 34, 35, 39	
Environmental Release Categories (ERC)	8a, 8b, 8c, 8d, 8e, 8f, 9a, 9b	
Processes, tasks, activities covered		
Covers general exposures to consumers arising from the use of household products sold		
Assessment Method		
See Section 3.		
Section 2 Operational conditions and risk management measures		
Section 2.1 Control of consumer exposure		
Product characteristics		
Physical form of product	Powder or liquid	
Vapour pressure	1.03 Pa (1175 °C)	
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100%	
Amounts used	No limit	
Frequency and duration of use/exposure	Covers frequency up to: daily use, weekly, monthly, yearly	
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures; assumes use in a 20 m^3 room (ECHA guidance R.15, 2008) assumes use with typical ventilation.	
Product Category	**Specific Risk Management Measures (RMM) and Operational Conditions (OC)** ***(only required controls to demonstrate safe use listed)***	
PCs - general case	OC	In consumer products the irritation hazard of soluble silicates is addressed, if necessary, by appropriate labelling and the advice to use (household) gloves on the consumer product. In general, dermal, inhalation and oral consumer exposure to commercially available products is minimised due to formulation (limited concentration of soluble silicates, particle size distribution, agglomeration and dust potential, tablets and gels), packaging and bad taste of commercially available products.
	RMM	No specific RMMs identified beyond those OCs stated.
PC 1, 3, 8, 9a, 9b, 9c, 15, 16, 17, 31, 34, 35, 39	OC	Covers use up to 365 days/year; covers use under typical household ventilation.
	RMM	No specific RMMs identified beyond those OCs stated.
Section 3 Exposure Estimation		
3.1. Health		
Some product uses could result in local irritation (skin and eyes) if highly concentrated products, which is usually not the case, are used. This hazard is addressed, if necessary, by appropriate labelling and the advice to use household gloves on the consumer product. In general, dermal, inhalation and oral consumer exposure to commercially available products is minimised by formulation measures (use of limited concentrations, reduction of dust potential by agglomeration or use of tablets and gels), bad taste of the products, packaging devices (sealing of tablets, child-resistant fastenings) or denaturing.		
Section 4 Guidance to check compliance with the Exposure Scenario		
4.1. Health		
Besides the product integrated RMMs, consumer instructions and the communication on the safe use should be implemented, including technical use instructions, instructions on use of protective clothing and behaviour, storage and disposal instructions. The implemented risk mitigation measures will ensure that consumer´ exposure is reduced in a way that health hazard effects are avoided and that the risk is considered to be adequately controlled.		