

Section 1: Product and Company Identification:

1.1 Product Identifier

| | |
|----------------------------------|---------------------------------------|
| Product Form: | Mixture |
| Identification of Substance: | Silicon Dioxide and Water |
| Product Name: | NexSil™ 12 |
| Synonym: | Colloidal Silica Sol |
| CAS Number: | 7631-86-9 |
| Index Number: | Not available. |
| EINECS Number: | 231-545-4 |
| REACH Registration Number: | 01-2119379499-16-0220 |
| Formula: | SiO ₂ |
| Nanoforms: | SiO ₂ exists as a nanoform |
| Unique formula identifier (UFI): | Not required |

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

| | |
|----------------------|--|
| Recommended Use: | Papermaking. Ceramics. |
| Restrictions on Use: | For industrial use only, not for food, drug or home use. |

1.3 Details of the supplier of the safety data sheet

| | |
|-------------------------|--|
| Company Identification: | Nyacol Nano Technologies, Incorporated Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A. 508-881-2220 |
| Email Contact: | info@nyacol.com |
| Internet: | www.nyacol.com |

1.4 Emergency telephone number

| | |
|-----------------------|--|
| In Case of Emergency: | USA/Canada CHEMTREC: +1 (703) 527-3887 International CHEMTREC: +1 (703) 741-5970 24 Hours/Day: 7 Days/Week |
|-----------------------|--|

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Not classified.

Classification according to Regulation (EC) No. 1272/2008 (CLP)
Not classified.

2.2 Label Elements

Not labelled.
Signal Word: Not applicable.
Hazard Pictogram: Not applicable.
Hazard Statement(s): Not applicable.
Precautionary Statement(s): Not applicable.

2.3 Other Hazards

Components do not meet the criteria for a PBT or vPvB substance.

2.4 Unknown acute toxicity (GHS US)

No information available.

Section 3: Composition / Information on Ingredients

3.1 Chemical characterization: Mixtures

Description: Mixture consisting of the following components.

| Component Name: | Product Identifier | GHS Classification | Percent By Weight | SCL, M-factor, ATE |
|------------------|---|--------------------|-------------------|--------------------|
| Silicon Dioxide: | CAS: 7631-86-9 EINECS: 231-545-4 Index: Not available | Not classified | 30 | |
| Water: | CAS: 7732-18-5 EINECS: 231-791-2 Index: Not available | Not classified | 70 | |

Impurities: Present at a level below that to be taken into account for classification.

Stabilizing Additives: None

The supplier currently has no knowledge on additional ingredients that are classified and that contribute to the classification of this substance.

Nanoform characteristics:

| Name of nanoform: Synthetic amorphous silicon dioxide | | |
|---|-----------|--------|
| | Value | |
| Number based particle size distribution, nm | d10 | 4-56 |
| | d50 | 8-75 |
| | d90 | 12-110 |
| Shape and aspect ratio | Spherical | |
| Crystallinity | Amorphous | |
| Surface functionalization | None | |
| Specific surface area, m ² /g | 50-600 | |

See Section 16 for a list of hazards if identified above.

Section 4: First-Aid Measures

4.1 Description of first aid measures

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|-----------------------|---|
| Eye Contact: | Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of the eye and lids with water. Get medical attention. |
| Skin Contact: | In case of contact, immediately flush skin with plenty of water for several minutes. Remove contaminated clothing. Get medical attention if skin irritation develops or persists. |
| Inhalation: | If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention. |
| Ingestion: | If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.) but do not induce vomiting. If vomiting occurs, give fluids again. Do not give anything by mouth to an unconscious or convulsing person. Get medical attention. |
| First Aid Facilities: | Eye wash station. |
| Advice to Physicians: | No further relevant information available. |

4.2 Most important symptoms and effects, both acute and delayed

Acute or delayed effects are not anticipated.

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

No further relevant information available.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media: All are suitable. Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product: Material will not burn in a fire. Containers can build pressure if exposed to heat or fire.

Special Hazard Arising from the Chemical: None known.

Fire Hazard: None known.

Explosion Hazard: None known.

Reactivity: None known.

5.3 Advice for firefighters

Special Protective Equipment for Fire-fighters: Wear standard full firefighter turn-out gear (full bunker gear) and respiratory protection (SCBA).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Eye protection and impervious gloves. An approved air-purifying respirator should be worn if dust or mist is present.

6.1.1 For non-emergency personnel

Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions

Prevent entry into sewers and waterways.

6.3 Methods and material for containment and cleaning up

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

6.4 Reference to other sections

For more information on exposure controls and personal protection or disposal considerations, check section 8 and 13 of this SDS.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Minimum feasible handling, and temperatures should be maintained. Avoid generating mist during use. Use only in well ventilated area.

7.1.1 Protective measures

Use only in well ventilated areas. As a precautionary measure, the wearing of standard work gear is suggested.

7.1.2 Advice on general occupational hygiene

Avoid inhalation, ingestion and contact with eyes. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

Keep from freezing. Periods of exposure to high temperatures should be minimized. Provide sufficient ventilation in storage and workrooms. Store in a cool dry area.

7.3 Specific end use(s)

No additional information available. Refer to Section 1.2 of this SDS.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters

8.1.1 National Limit Values

Silicon Dioxide, CAS 7631-86-9

| Country | Occupational exposure limit | Reference period | Reference |
|---------|---|------------------|--|
| USA | 80 mg/m ³ /%SiO ₂ | 8 hours | OSHA PEL – http://www.cdc.gov/niosh/idlh/7631869.html |
| UK | 6 mg/m ³ (inhalable) | 8 hours | Health and Safety Executive – http://www.hse.gov.uk/pubns/priced/eh40.pdf |
| Germany | 4 mg/m ³ (inhalable) | 8 hours | Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (MAK Commission): http://www.dfg.de/en/dfg_profile/statutory_bodies/senate/health_hazards/index.html |
| Belgium | 10 mg/m ³ | 8 hours | Service public fédéral Emploi, Travail et Concentration sociale: http://www.emploi.belgique.be/WorkArea/showcontent.aspx?id=23914 |
| Austria | 2 mg/m ³ (inhalable) | 8 hours | http://www.arbeitsinspektion.gv.at/NR/rdonlyres/F173280B-D4FB-44D28269-8DB2CB1D2078/0/GKV2011.pdf |

8.1.2 DNELs and PNECs

Silicon Dioxide, CAS 7631-86-9

DNEL (Derived No Effect Level)

| Route of Exposure/Environmental protection target | DNEL |
|---|---------------------|
| Inhalation – Long term/systemic effects | 4 mg/m ³ |

PNEC (Predicted No Effect Concentration)

No information available

8.2 Exposure Controls

Engineering Controls:

Ventilation adequate to meet occupational exposure limits.

Hygiene Measures:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be changed and laundered or dry-cleaned.

Respiratory:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air-supplied respirators should always be worn when airborne concentrations of the contaminant or oxygen content is unknown.

Hands:

Wear impervious gloves such as neoprene.

Eyes:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin:

Wear clean body-covering clothing; impervious gloves such as neoprene. Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Environmental Exposure Controls: Adverse effects of this material on the environment have not been evaluated. Proper disposal techniques to isolate and recover material should be implemented.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

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|--|--|
| Physical State | Liquid |
| Color: | Translucent white |
| Odor: | Odorless |
| Melting point/freezing point: | Not determined |
| Boiling point: | 100 °C (212 °F) |
| Flammability: | Not flammable |
| Lower and upper explosion limit: | Not applicable |
| Flash point: | Not applicable |
| Auto-ignition temperature: | Not applicable |
| Decomposition temperature: | Not applicable |
| pH: | 10 |
| Kinematic viscosity, mm ² /s | 2-10 |
| Solubility: | Fully miscible with water. Nanoform solubility 0.01% in water. |
| Partition coefficient, n-octanol/water (log value) | Not determined |
| Vapor pressure | 2260 kPa (17 mm Hg) at 20°C water |
| Relative density (specific gravity) | 1.2 |
| Relative vapor density | Not determined |
| Particle characteristics | See Section 3 for nanoform characteristics |

9.2 Other information

Not applicable.

Section 10: Stability and Reactivity

10.1 Reactivity

Not determined.

10.2 Chemical Stability

Stable.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

No recommendation.

10.5 Incompatible materials

Not determined.

10.6 Hazardous decomposition products

Not determined.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity:

LD50, Rat, Oral Values for classification:

Silicon Dioxide, 7631-86-9

Water:

Skin corrosion/irritation:

Eye damage / eye irritation

> 5000 mg/kg

None reported.

Avoid contact with skin, may cause skin irritation or dryness.

Avoid contact with eyes, may cause irritation.

| | |
|------------------|--|
| Inhalation: | Use breathing protection when aerosol or mist is formed. Breathing dried dust or spray mist causes irritation. OSHA exposure limit: Amorphous Silica = 20 mppcf (5 mg/M ³) SiO ₂ respirable dust or mist. 8-hour time weighted average. Exposure analysis method: NIOSH Manual of Analytical Methods, 3rd edition, Method 7501. |
| Sensitization: | No sensitizing effect known. |
| Chronic Effects: | No further relevant information available. |
| Carcinogenicity | No data indicating any concern for carcinogenicity. |

Section 12: Ecological Information

12.1 Aquatic Toxicity, Silicon Dioxide CAS #7631-86-9

Not harmful to aquatic organisms.

12.2 Persistence and degradability

No further relevant information available.

12.3 Bioaccumulative potential

No further relevant information available.

12.4 Mobility in soil

No further relevant information available.

12.5 Results of PBT and vPvB Assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to this product.

12.6 Endocrine disrupting properties

No further relevant information available.

12.7 Other adverse effects

No further relevant information available.

Section 13: Disposal Considerations

This information presented only applies to the materials as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

| | |
|--------------------------|---|
| Disposal Considerations: | The product should be recycled or burned in an incinerator or scrubber approved for chemical waste. |
| United States: | The product is not a RCRA hazardous waste. |

Section 14: Transport Information

The product is not restricted for transportation.

Sections 14.1 - 14.4

Regulations

U.S. D.O.T.: Not regulated.

ICAO/IATA: Not regulated.

IMO/IMDG: Not regulated.

ADR: Not regulated.

14.5 Environmental Hazards

Not an environmental hazard for transport.

14.6 Special precautions for user

None.

14.7 Transport bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

Section 15: Regulatory Information

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

Worldwide Chemical Inventories

| | |
|-------------------------------|--|
| EINECS (EU): | All ingredients listed |
| TSCA (USA): | All ingredients listed – acti |
| DSL (Canada): | All ingredients listed |
| AICS (Australia): | All ingredients listed |
| ENCS (Japan): | All ingredients listed |
| ECL (Korea): | All ingredients listed |
| PICCS (Philippines): | All ingredients listed |
| IECSC (China): | All ingredients listed |
| Technical Instructions (air): | Not determined. |
| Water hazard class: | Based on available data, Silicon Dioxide is not classified as dangerous for the environment according regulation (EC) 1272/2008. |

| | |
|--|--|
| State Right-to-Know Laws: | Section 3 of this SDS lists all components of the product. |
| California Proposition 65: | No ingredients listed. |
| SARA Section 311/312 (29 CFR 1910.1200) Hazards: | Not classified according to GHS. |
| SARA 313, 304 and CERCLA 102 (A): | No ingredients listed. |
| FDA: | 21 CFR 175.105 – Silicon Dioxide may be used as a component of adhesives used to prepare articles intended for the use in packaging, transporting or holding food. 21 CFR 177.1200 – Silicon Dioxide may be used as a component of a polymer used as a base sheet or as a coating applied to a base sheet for use in food packaging. 21 CFR 182.90 – Silicon Dioxide is generally recognized as safe (GRAS) as a substance migrating to food from paper and paper board products used in food packaging. |
| WHMIS: | Not controlled. |
| Controlled Products Regulations: | This SDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format. |

15.2 Chemical safety assessment

A chemical safety assessment has not been carried out for silicon dioxide.

Section 16: Other Information

List of hazard phrases: None, product is not classified.

National Fire Protection Association (U.S.A.) 704 Hazard Health-1, Flammability-0, Reactivity-0, Special-None
HMIS® Hazard Rating: Health-1, Flammability-0, Reactivity-0, Protective Equipment – B; safety glasses, gloves.

Recommended Use: The product is recommended for use in papermaking and ceramics. Other uses have not been investigated and may have other hazards. For industrial use only, not for food, drug or home use.



SAFETY DATA SHEET

NexSil™ 12

REVISION: November 7, 2024
SUPERSEDES: June 3, 2020
VERSION NO.: 4

Work Alert:

Workers using the product should read and understand this SDS and be trained in the proper use of this material.

**Other Special Considerations:
SDS Prepared By:**

None known.
Andrew A. Guzelian
Nyacol Nano Technologies, Incorporated
Telephone: 508-881-2220 U.S.A.
November 7, 2024
June 3, 2020

**Revision Date:
Supersedes:**

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