

### 1. Product and Company Identification

**Product Name:** JIOS AeroVa® Aerogel Powder

**Chemical Name:** Trimethylated silica gel

**Use of the Substance/Preparation:** Material, Industrial Products, Various  
High performance insulation material  
Biochemical carriers

**Supplier:**  
JIOS Aerogel Corporation  
531-14, Gajang-ro, Osan-si,  
Gyeonggi-do, Korea 447-210  
Tel : +82 31 379 8700  
Fax: +82 31 379 8788, 8799

### 2. Hazards Identification

**Note to section 2:** Hazard identification is based on literature review for synthetic amorphous silica (CAS No.7631-86-9)

**Hazard-Risk Classification** Acute dermal toxicity Category 5  
Acute Inhalation toxicity (Dusts and Mists) Category 4

**Label elements including precautionary statements**

**Symbol:**



**Signal Word:** Warning

**Hazard-Risk Statement:** H332 Harmful if inhaled.  
H313 May be harmful in contact with skin.

**Precautionary Statement**

**\*Prevention:** P261 Avoid breathing dust.  
P271 Use only outdoors or in a well-ventilated area.

**\*Response:** P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P312 Call a poison center or doctor/ physician if you feel unwell.

**Other Hazard-Risk which is not included in the classification criteria**

NFPA HAZARD CLASSIFICATION			
Health	Fire	Reactive	Other
1	1	0	N/A
HMIS HAZARD CLASSIFICATION			
Health	Flammability	Physical Hazard	Protection
1	1	0	Please refer to Section 8

### 3. Composition/Information on Ingredients

Chemical Name	Other Name	CAS Number	Content (%)
trimethylated silica gel	Silica gel, trimethylsilated	7631-86-9	≥ 98
Water	-	7732-18-5	< 2

### 4. First Aid Measures

**Eye Contact:**

Flush eyes immediately with large amount of water for 15 minutes. If irritation occurs and persists, get medical treatment.

**Skin Contact:**

Remove contaminated clothing and shoes from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.

**Inhalation:**

If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.

**Ingestion:**

Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person. Material will pass through the body normally.

**Acute and Delayed Symptoms/Effects:**

Acute and Chronic high concentration of this material may cause irritation to eyes skin, Acute and Chronic high concentration of this material may cause irritation to eyes skin, respiratory tract and have an effect on Lung. **Note:** See section 11 for toxicological information

**Indication of Immediate Medical Attention and Notes for Physician:**

Treat symptomatically.

### 5. Fire-Fighting Measures

**Suitable (and unsuitable) extinguishing media:**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

On large fires, use dry chemical, foam or water spray. On small fires, use carbon dioxide (CO<sub>2</sub>), dry chemical or water spray. Water can be used to cool fire exposed containers.

**DO NOT USE** a solid water stream as it may scatter and spread fire.

**Specific hazards arising from the chemical**

**Specific Hazards:** Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus.

**Hazardous Combustion Products:** Heating can release vapors which can be ignited.

Avoid temperatures above 400°C. The product is insoluble and floats on water. If possible, try to contain floating material.

Carbon monoxide, Carbon dioxide, Organic products of decomposition.

**Risk of Dust Explosion:** Dust may form explosive mixture in air. Take precautionary measures against static discharges.

### Special protective equipment and precautions for fire-fighters

Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Use water spray to keep fire exposed containers cool. Determine the need to evacuate or isolate the area according to your local emergency plan.

## 6. Accidental Release Measures

### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Avoid dust formation. Ensure adequate ventilation. Remove all sources of ignition. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment.

### Protective equipment and emergency procedures

**Eyes:** Use full face respirator.

**Skin:** Wash at mealtime and end of shift. Wear protective clothing to minimize mechanical irritation.

**Inhalation/Suitable Respirator:** Respiratory protection recommended. Follow OSHA Respirator Regulations (29 CFR 1910.134) and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

**Precautionary Measures:** Avoid eye and skin exposure. Avoid breathing dust. Keep container closed. Use reasonable care.

**Note:** These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

### Environmental precautions and protective procedures

The product is insoluble and floats on water. If possible, try to contain floating material. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

### The methods of purification and removal

Remove possible ignition sources. Clean up promptly by vacuum. Sweep, mop or wipe up and contain for salvage or disposal. Fine powders may require special vacuum filters; damp mopping or washing is preferred. Pick up and transfer to properly labeled containers. Avoid dust formation.

## 7. Handling and Storage

### Precautions for safe handling:

Dust may be harmful if inhaled. Avoid dust formation. Do not breathe dust. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Avoid contact with skin and eyes. Keep away from heat and sources of ignition. Take precautionary measures against static discharge. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

### Conditions for safe storage:

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Do not store together with oxidizing materials and volatile chemicals as they may be adsorbed onto product.

### 8. Exposure Controls and Personal Protection

#### Control parameters (e.g. occupational exposure limit values, biological limit values):

##### **EXPOSURE LIMITS**

There are no exposure limits identified for this specific product. Exposure limits for silica are stated below. \*\*Silica 7631-86-9\*\*

**Austria MAK:** 4 mg/m<sup>3</sup> (TWA, Inhalable fraction)

**Belgium OEL:** 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 3 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Germany TRGS 900:** 4 mg/m<sup>3</sup> (TWA, Inhalable fraction), 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 3 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Italy OEL:** 4 mg/m<sup>3</sup> (TWA, Inhalable fraction), 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 3 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Netherlands MAC:** 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 5 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Norway:** 1.5 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Spain:** 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 3 mg/m<sup>3</sup> (TWA, Respirable fraction)

**Sweden:** 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 5 mg/m<sup>3</sup> (TWA, Respirable fraction)

**UK WEL:** 6 mg/m<sup>3</sup> (TWA, Inhalable fraction), 2.4 mg/m<sup>3</sup> (TWA, Respirable fraction)

**US OSHA a PEL:** 15 mg/m<sup>3</sup> (TWA, total dust), 5 mg/m<sup>3</sup> (TWA, Respirable fraction)

**ACGIH:** 10 mg/m<sup>3</sup> (TWA, Inhalable fraction), 3 mg/m<sup>3</sup> (TWA, Respirable fraction)

#### Appropriate engineering controls:

Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Ensure adequate ventilation to maintain exposures below occupational limits.

#### Personal protective equipment:

##### **Respiratory protection**

Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Suitable Respirator: Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators.

##### **Eye/Face protection**

Use proper eye/face protection - safety glasses with side-shields as a minimum.

##### **Skin protection**

Repeated exposure may cause skin dryness or cracking. Use protective skin cream before handling the product. Wear suitable gloves for hands and protective clothing for body.

Remove and wash contaminated clothing before re-use. No special protective equipment required.

### 9. Physical and Chemical Properties

**Appearance:** White Particles

**Odour:** Odorless

**Odour threshold:** Not determined.

**pH:** Not applicable

**Melting point/Freezing point:** 1700 °C after partial decomposition

**Initial boiling point and boiling range:** 2230 °C after partial decomposition

**Evaporation rate:** Not applicable

**Flammability (solid, gas):** Not determined.

**Upper/lower flammability or explosive limits:** Not determined.

**Vapor pressure:** Not determined.

**Solubility:** Insoluble

**Vapor density:** Not determined.

**Relative density:** Not determined.

**Partition coefficient(n-octanol/water):** Not determined.(Floats on water; disperses in oil)

**Auto-ignition temperature:** 500°C

**Decomposition temperature:** Not determined.

**Viscosity:** Not determined.

**Formula mass:** Not determined.

### 10. Stability and Reactivity

**Chemical stability:** This product is stable.

**Possibility of hazardous reactions:** Hazardous polymerization does not occur.

**Conditions to avoid (e.g. static discharge, shock or vibration, etc.):**

Do not expose to temperature above 300°C. Avoid conditions where oxygen may condense in or around this product, as this will increase the flammability.

**Incompatibility with various substances:** Not available

**Hazardous decomposition products:**

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds.

### 11. Toxicological Information

**Note to section 11:** Toxicological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9)

#### Information on the likely routes of exposure

**Inhalation:**

Inhalation of airborne dusts may cause mechanical irritation of the upper respiratory tract.

**Skin Contact:**

Skin contact with dust from this product can produce a drying sensation and mechanical irritation of the skin and mucous membranes.

**Eye Contact:**

Exposure to dust from this product can produce a drying sensation and mechanical irritation of the eyes.

#### Delayed, acute and chronic toxic effect for short and long term exposure

**Acute toxicity (Oral)**

**Not Classified**

Rat LD50 >5110 mg/kg, OECD TG 401 GLP

**Acute toxicity (Dermal)**

**Category 5**

Rabbit LD50 > 2000 mg/kg

**Acute toxicity (Inhalation-dust)**

**Category 4**

Rat LC50 >2.2mg/L

**Skin Corrosion/ Irritation**

**Not classified**

Not irritating (OECD Test Guidelines 404, GLP).

Slightly hazardous in case of skin contact on human are **not irritating to skin and eyes** under experimental conditions.

**Serious Eye Damage/ Irritation**

**Not classified**

Not irritating (OECD Test Guidelines 405, GLP).

Draize score 0.7/110, 24 hr. Non-irritating. Synthetic amorphous silica is **not irritating to skin and eyes** on human under experimental conditions.

<p><b>Respiratory sensitizer</b> <b>Skin Sensitization</b></p>	<p><b>Not available</b> <b>Not classified</b> A delayed contact hypersensitivity study (Directive 84/449/EEC, B. 6) in guinea pigs utilizing the Buehler technique was performed. Not-sensitizing</p>
<p><b>Carcinogenicity</b></p>	<p><b>Not classified</b> Negative findings in a rat carcinogenicity (up to 5 % in the diet given to rats and mice) Not listed by NTP, OSHA, ACGIH or EU.IARC: Group 3</p>
<p><b>Mutagenicity</b></p>	<p><b>Not classified</b> <i>In vitro</i> - Not mutagenic in Ames Test, chromosomal aberration in Chinese hamster ovary (CHO) cells. <i>In vivo</i> – Not mutagenic in cytogenetic assay.</p>
<p><b>Reproductive toxicity Not classified</b></p>	<p>NOAEL&gt;497 mg /kg bw/d No evidence of adverse effects on reproduction performance</p>
<p><b>Specific target organ toxicity (single exposure)</b></p>	<p><b>Not classified</b> Silica gel administered intratracheally resulted in no fibrosis. The tissue reaction (peritoneal) to 11 types of amorphous silica was examined and 3 types failed to produce peritoneal fibrosis; 2 of these were dried precipitated silica and 1 was dried silica gel.</p>
<p><b>Specific target organ toxicity (repeated exposure)</b> <b>Inhalation</b></p>	<p><b>Not classified</b> <b>Human effects:</b> The potential clinical toxicology of exposure to precipitated amorphous <b>silica</b> in 165 workers who had been exposed for an average of 8.6 years was studied. Serial pulmonary function values and chest radiographs were not adversely affected by long-term exposure to this dust. <b>Animal effects:</b> NOAEL: 0.035 mg/L (subchronic, 13 weeks). Mild reversible pro-inflammatory cell proliferation, stimulation of collagen production, increase in lung weight, incipient interstitial fibrosis, slight focal atrophy in the olfactory epithelium.</p>
<p><b>Oral</b></p>	<p><b>Animal effects:</b> NOAEL&gt; 8% (sub-chronic, 13 weeks) No clinical signs and other findings.</p>
<p><b>Aspiration Hazard</b></p>	<p>Not available</p>

### 12. Ecological Information

**Note to section 12:** Ecological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9).

**Aquatic and terrestrial ecotoxicity Not classified**

**Fish** 96hr LC50 > 10,000 mg/l (*Brachydanio rerio*, OECD TG 203)  
**Water flea** 24hr EC50 > 10,000 mg/l (*Daphnia magna*, OECD TG 201)

**Degradability**

**Stability** Stable  
**Degradability** The methods for determining biodegradability are not applicable to inorganic substances.

**Bioaccumulative potential**

**Biodegradable** Not applicable for inorganic material.  
**Enrichment** Not applicable for inorganic material.

**Mobility in soil**

Insoluble. Not expected to migrate.

**Other adverse effects**

None expected.

### 13. Disposal Considerations

**Disposal method**

Can be burned in suitable incineration plants or disposed of in a suitable landfill in accordance with the regulations issued by the appropriate federal, provincial, state and local authorities.

**Disposal precaution**

RCRA Hazard Class (40 CFR 261): Not classified.

### 14. Transport Information

**Not classified as dangerous in the meaning of transport regulations.**

Shipping Name: Not regulated for transport  
 Hazard Class / UN Number / Packing Group / Required Label(s) / Marine Pollutant / Additional Information / DOT Road Shipment Information (49 CFR 172.101) / Ocean Shipment (IMDG) / Air Shipment (IATA): None

### 15. Regulatory Information

**Hazard Classification**

**United States** - OSHA (29 CFR 1910.1200): Not hazardous.

**Mexico** - NOM-018-STPS-2000: Refer to HMIS Rating in Section 16.

**Canada** - WHMIS Classification (CPR, SOR/88-66): Not controlled.

**International Inventories:**

*This material is listed on or exempt from the following inventories:*

- Australian Inventory of Chemical Substances (AICS) / Canadian Domestic Substances List (DSL) / European Inventory of Existing Commercial Chemical Substances (EINECS) / New Zealand Hazardous Substances and New Organisms Act (HSNO) / United States Toxic Substances Control Act (TSCA) Inventory: **YES**

- Chinese Inventory / Japanese Inventory of Existing and New Chemical Substances (ENCS) / Korean Existing Chemicals List (KECL) / Philippines Inventory of Chemicals and Chemical Substances

9/10 page  
 (PICCS): **No**

**NOTE:** The chemicals in this product may not be subject to notification in the following countries under an "article" exemption: Canada, Japan, Korea, New Zealand and Switzerland.

### U.S. Federal Regulations

**TSCA 12(b) Export Notification:** This product does not contain any components that are subject to TSCA 12(b) Export Notification.

**Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82):** This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletory.

**Clean Water Act (CWA, 40 CFR 116) Priority Pollutants:** This product does not contain any listed Priority Pollutants.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302):** This product does not contain any listed Hazardous Substances.

**Superfund Amendments and Reauthorization Act, Title III (SARA):** SARA Section 302 (40 CFR 355) Extremely Hazardous Substances: No components are listed as extremely hazardous chemicals under SARA Section 302. SARA Sections 311/312 (40 CFR 370) Hazard Category: This product does not meet any of the MSDS Requirement definitions for a hazardous material under SARA Sections 311/312. SARA Section 313 (40 CFR 372) Toxics Release Inventory: Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the minimum concentrations necessary to be subject to this rule.

**Pharmaceutical Information:** Not permitted U.S. State Regulations

**California Proposition 65:** This product does not contain any components listed on California Proposition 65.

**US Coalition of North Eastern Governors (CONEG) Metals List:** This product meets the CONEG Source Reduction Council limits for the sum of the levels of lead, cadmium, mercury and hexavalent chromium of less than 100 parts per million by weight.

### EC Regulatory Information

Product is not a classified as a dangerous material or preparation as defined in EC Directives 67/548/EEC or 1999/45/EC and EU CLP.

## 16. Other Information

### **Information source and references**

Korea Occupational Health & Safety Agency: <http://www.kosha.net>

National library of Medicine (NLM) Hazardous Substances Data Bank (HSDB):

<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm>

ECOTOX Database, EPA (<http://cfpub.epa.gov/ecotox>)

ECB-ESIS (European chemical Substances Information System) (<http://ecb.jrc.it/esis>)

International Uniform Chemical Information Database (IUCLID) (<http://ecb.jrc.it/esis>)

International Program on Chemical Safety (IPCS INCHEM) (<http://www.inchem.org/>)

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008

American Conference of Governmental Industrial Hygienists TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

Cincinnati, OH, 2008, p. 35

IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. Geneva:

World Health Organization, International Agency for Research on Cancer, 1972-PRESENT.

(Multivolume work), p. S7 216 (1987)

United Nations Environmental Programme (UNEP)

Organization for Economic Co-operation and Development (OECD) Screening Information Data Set (SIDS) Initial Assessment Report, Synthetic Amorphous Silica, July 23, 2004

**Prepared by:** Corporation - Safety, Health and Environmental Affairs

**Issuing date:** 23/10/2014

**Revision number and date:** 3, 27/5/2013

**Reason for revision:** -





# Safety Data Sheet

JIOS AeroVa<sup>®</sup> Aerogel Powder

Revision Date : 11/01/2016

---

**Disclaimer:**

The Data set forth in these sheets are based on the information provided by the suppliers of the raw materials and chemicals used in the manufacturing of the aforementioned product. JIOS AEROGEL LIMITED makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereon.

**® and 'TM' indicate trademarks of JIOS AEROGEL Limited.**