

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Product Name: Spaceloft ® Subsea

Synonyms: Silica aerogel materials

Use of the Substance/Preparation: High performance insulation material

Manufacturer: Aspen Aerogels, Inc.

Address: 30 Forbes Road,
Northborough, MA 01532

Telephone: (508) 691-1111

Email: EHS@aerogel.com

Emergency Telephone Number: 800-535-5053 US (INFOTRAC)
352-323-3500 INTERNATIONAL

2. HAZARDS IDENTIFICATION

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

Emergency Overview: Inhalation of excessive amounts of dust from the product may cause mechanical irritation to the respiratory tract. Dermal contact may cause mechanical irritation.

POTENTIAL HEALTH EFFECTS

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

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

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

Ingestion: This material is not intended to be ingested (eaten). If ingested in large quantity, the material may produce mechanical irritation and blockage

Acute Health Hazards: Dust from this product is a physical irritant, and may cause temporary irritation or scratchiness of the throat and / or itching and redness of the eyes and skin.

Chronic Health Hazards: Product contains carbon black. Carbon black is listed by the International Agency for Research on Cancer (IARC) as “possibly carcinogenic to humans (Group 2B)”. Per the fiberglass manufacturer, the fiberglass is considered textile grade and is not classified as a human carcinogenic by IARC (Group 3), ACGIH (Group A4), NTP, or OSHA.

Medical Conditions Aggravated by Exposure: Excessive inhalation of dust may aggravate pre-existing chronic lung conditions including, but not limited to, bronchitis, emphysema, and asthma. Dermal contact may aggravate existing dermatitis.

CARCINOGENICITY

Component	ACGIH	NTP	IARC
Amorphous Silica	NA	Not Listed	3
Continuous Filament Glass Fibers	A4	Not Listed	3
Polyethylene terephthalate	NA	Not Listed	None
Carbon Black	A4	Not Listed	2B

SECTION 2 NOTES: This product is composed of amorphous silica dioxide, often referred to as silica gel or amorphous precipitated silica. Amorphous silica should not to be confused with crystalline silica. Epidemiological studies indicate low potential for adverse health effects from exposure to amorphous silica.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Percent	CAS Number	EINECS Number	EU Classification
Methylsilylated Silica	50-80	68909-20-6	272-697-1	None
Polyethylene terephthalate (PET or polyester)	10-30	25038-59-9	Not Assigned	None
Fibrous glass (textile grade)	10-30	NA	Not Assigned	None
Carbon black	0-5	1333-86-4	215-609-9	None

4. FIRST AID MEASURES

- Eye Contact:** Immediately wash with large amounts of water for at least 15 minutes, occasionally lifting lids. If irritation occurs and persists, get medical treatment.
- Skin Contact:** Wash skin thoroughly with soap and plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Obtain medical attention if symptoms occur.
- Ingestion:** Material will pass through the body normally.
- Inhalation:** Remove to fresh air. Drink water to clear throat and blow nose to remove dust. Obtain medical attention if ill effects persist.

5. FIRE-FIGHTING MEASURES
5.1 FLAMMABILITY PROPERTIES

Auto ignition Temperature	Not Applicable
Flash Point	Not Applicable
Flammability Limits:	Not Applicable

5.2 EXTINGUISHING MEDIA

Use media suitable for surrounding fire and that are appropriate to the surrounding environment; normal fog nozzle water application and/or exclusion of air is typically suitable for extinguishing this product in blanket form.

5.3 PROTECTION FOR FIRE FIGHTERS

- Special Fire Fighting Procedures:** Normal fire fighting procedures should be followed to avoid inhalation of smoke and gases produced by a fire.
- Unusual Fire and Explosion Hazards:** Product is a super-insulation material. Rolls of material can retain heat within internal layers causing re-ignition in the presence of oxygen if heat is not removed.
- Hazardous Decomposition Products:** Primary combustion products are carbon monoxide and carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

- Personal Precautions:** Minimize dust generation. Ensure adequate ventilation. Use personal protective equipment as necessary.
- Environmental Precautions:** Material is not soluble. Do not flush into surface water or sanitary sewer system.
- Methods for Cleaning Up:** Contain and collect released material for proper disposal. Dry vacuuming is the preferred method of cleaning up.

7. HANDLING AND STORAGE

Handling Aerogel blankets will generate dust when handled. Workplace exposure to all dusts should be controlled with standard industrial hygiene practices. Dry vacuuming is the preferred method for cleaning up dust. Because aerogel dust is hydrophobic, water is not effective as a dust control agent.

Storage Aerogel blankets should be kept in their packaging until they are ready to be used. Unpack the material in the work area. This will help to minimize the area where dust exposure may occur. Trimmed material and scrap should be promptly packed in disposal bags.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Limit Values

There are no exposure limits identified for the main product component, classified as synthetic amorphous silica. Exposure limits for synthetic amorphous silica are based on silica (CAS No. 7631-86-9).

CAS Number	Component Name	Exposure Limits
7631-86-9	Silica, Amorphous	Germany TRGS 900 UK WEL
		US OSHA PEL (TWA) ^a : US ACGIH ^b
1333-86-4	Carbon Black	Brazil, Canada, Finland, France INRS, Ireland, Italy OEL, Korea, Netherlands MAC, Norway, Spain, UK WEL, US ACGIH, US OSHA Germany TRGS 900
		Germany MAKs
NA	Continuous filament glass fibers	Finland, Ireland, UK WEL US ACGIH
		US OSHA

4 mg/m³ (inhalable fraction)
6 mg/m³ (inhalable fraction)
2.4 mg/m³ (respirable fraction)
15 mg/m³ (total dust)
5 mg/m³ (respirable fraction)
10 mg/m³ (inhalable)
3 mg/m³ (respirable)
3.5 mg/m³, TWA

10.0 mg/m³ (inhalable)
3.0 mg/m³ (respirable)
4 mg/m³ (inhalable)
1.5 mg/m³ (respirable)
7.0 mg/m³ STEL
1.0 fibers/cc^c
5 mg/m³ (inhalable)
10 mg/m³ (total dust)
5 mg/m³ (respirable fraction)

^a The US OSHA standard for amorphous silica is: (80 mg/m³)/(%SiO₂). NIOSH Sampling Method 7501 for Amorphous Silica calculates the %SiO₂ based on the percentage of crystalline silica in the sample. Because aerogel contains 0% crystalline silica, the particulate limit applies.

^b US ACGIH based on Particles Not Otherwise Specified (PNOS)

8.2 Exposure Control

Ventilation: Local exhaust in accordance with general industrial hygiene practices is recommended to control dust.

Respiratory Protection: A properly fitted, NIOSH or CE approved respirator should be worn when ventilation is unavailable or inadequate to maintain airborne concentrations below applicable occupational exposure limits. A respiratory protection program that meets applicable local regulations should be implemented whenever workplace conditions warrant use of a respirator.

Hand Protection Silica aerogels are hydrophobic (repel water) and may cause drying and irritation of the skin, eyes, and mucous membranes. For this reason, nitrile, latex, or other impermeable gloves should be worn when handling aerogel blankets.

Eye Protection: Safety glasses, or chemical goggles as needed to provide greater protection from dust.

Skin Protection: Long-sleeved, long-legged work clothes are also advised. Disposable coveralls should be considered to minimize skin exposure and track out of aerogel dusts into adjacent areas.

Work Hygienic Keep materials packaged until just prior to use. Dry vacuum with proper filtration is preferred

Practices to sweeping. Wash thoroughly after using the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Opaque black fabric blanket, material is hydrophobic (repels water). Fabricated blankets are encased in silver foil packaging for ease of installation..
Odor:	No characteristic odor. Under certain conditions, product may have faint ammonia-like odor.
pH:	Not applicable.
Boiling Point/Range:	Not applicable.
Flash Point:	Not applicable.
Flammability (solid, gas):	Not applicable.
Explosive Properties:	Not applicable.
Oxidizing Properties:	Not applicable.
Vapor Pressure:	Not applicable.
Solubility:	Insoluble.
Viscosity:	Not applicable.
Evaporation Rate:	Not applicable

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable
Conditions to Avoid:	Prolonged exposure to temperatures above the recommended use temperatures.
Materials to Avoid:	None known
Hazardous Decomposition Products	Under recommended usage conditions, hazardous decomposition products are not expected.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Dust may cause mechanical irritation and dryness to eyes and skin.

Oral LD50:	>5,000 mg/kg (synthetic amorphous silica); >8,000 mg/kg (carbon black)
Inhalation LC50:	>2,000 mg/m ³ (synthetic amorphous silica)
Dermal LD50:	>3,000 mg/kg (synthetic amorphous silica)
Eye Irritation:	Synthetic amorphous silica and silicates are not irritating to skin and eyes under experimental conditions, but may produce dryness following prolonged and repeated exposure.
Skin Irritation:	Synthetic amorphous silica and silicates are not irritating to skin and eyes under experimental conditions, but may produce dryness following prolonged and repeated exposure. Carbon black can be a slight skin irritant.

Carcinogenicity

The International Agency for Research on Cancer (IARC) considers synthetic amorphous silica to be *not classifiable as to its carcinogenicity to humans* (Group 3). IARC considers carbon black to be possibly carcinogenic to humans (Group 2B). The Group 2B category is used for agents for which there is *limited evidence of carcinogenicity* in humans and less than *sufficient evidence of carcinogenicity* in experimental animals. IARC requires the 2B classification when one animal species exhibits carcinogenicity in two or more studies. IARC concluded that there is inadequate evidence in humans for the carcinogenicity of carbon black. The German MAK Commission classifies carbon black as a suspect carcinogen category 3B. ACGIH classifies carbon black as A4, Not Classifiable as a Human Carcinogen. US OSHA has not listed carbon black as a carcinogen.

NOTE TO SECTION 11: Toxicological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9). Toxicological information for carbon black is based on information from the International Carbon Black Association (ICBA).

12. ECOLOGICAL INFORMATION

Aquatic Toxicity	Synthetic Amorphous Silica: Fish: LC50 > 10,000 mg/L (Brachydanio rerio: 96 hour), Method OECD 203 Daphnia magna: EC50 > 10,000 mg/l (24 hours), Method OECD 202
	Carbon Black: Fish: LC50 > 1,000 mg/L (Brachydanio rerio: 96 hour), Method OECD 203 Daphnia magna: EC50 > 5,600 mg/l (24 hours), Method OECD 202
Mobility	None expected due to insoluble nature of product.
Persistence and Biodegradability	Not applicable for inorganic material.
Bioaccumulative Potential	None expected due to insoluble nature of product.
Other Adverse Effects	None expected.

NOTE TO SECTION 12: Ecological information is based on literature review for synthetic amorphous silica (CAS No. 7631-86-9) and carbon black.

13. DISPOSAL CONSIDERATIONS

Dispose in an approved landfill in accordance with federal, state / provincial, and local regulation. Cover promptly to avoid blowing of dust. This product is not regulated as a hazardous waste under US RCRA regulations.

14. TRANSPORT INFORMATION

Shipping Name:	Not regulated for transport
Hazard Class	None
UN Number	None
Packing Group	None
Required Label(s)	None
Marine Pollutant	No
Additional Information	None

15. REGULATORY INFORMATION

EC REGULATORY INFORMATION

Product is not classified as a dangerous material or preparation as defined in EC Directives 67/548/EEC or 1999/45/EC. Aerogel insulation blankets are considered an article, not a substance or preparation, under the REACH directive.

CANADIAN REGULATIONS

All chemical substances in this product are included on or exempted from the Canadian Domestic Substance List (DSL). Amorphous silica (CAS No. 7631-86-9) and carbon black are listed on the WHMIS Ingredient Disclosure List at a concentration threshold of 1 %.

U.S. FEDERAL REGULATIONS

CERCLA (Comprehensive Response Compensation and Liability Act): Product is not classified as hazardous or reportable under this requirement.

SARA TITLE III (Superfund Amendments and Reauthorization Act): Product is not classified as hazardous or reportable under this requirement.

311/312 HAZARD CATEGORIES: Product is not classified as hazardous or reportable under this requirement.

313 REPORTABLE INGREDIENTS: Product is not classified as hazardous or reportable under this requirement.

STATE REGULATIONS: Amorphous silica, CAS RN 7631-86-9, appears on the following state hazardous substance lists: CA, IN, KY, MA, MN, NC, NJ, OR, PA. This product contains a component (Carbon Black) that is listed on California Proposition 65. Check individual state requirements.

INTERNATIONAL REGULATIONS: Amorphous silica, CAS RN 7631-86-9, is listed on the WHMIS Ingredient Disclosure List at a concentration threshold of 1 %. Carbon black's WHMIS Classification is D2A.

TSCA: All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

16. OTHER INFORMATION

NFPA HAZARD CLASSIFICATION

Health **1**
Flammability **1**
Reactivity **0**
Other **N/A**

HMIS HAZARD CLASSIFICATION

Health **1**
Flammability **1**
Reactivity **0**
Protection **Please refer to Section 8.**

Section 11 Toxicity Information References: 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, Carbon Black User's Guide, Safety, Health & Environmental Information, International Carbon Black Association (ICBA).

Revision Summary: This revised safety data sheet replaces all previous versions. The safety data sheet was updated to reflect change to product name.

DISCLAIMER: The information herein is presented in good faith and believed to be accurate as the effective data given. However, no warranty, expressed or implied, is given. It is the user's responsibility to ensure that its activities comply with Federal, State or Provincial, and local laws.