



MATERIAL SAFETY DATA SHEET

REVISION DATE: March 24, 2004

SECTION I: MANUFACTURER AND MATERIAL

MATERIAL TRADE NAME: Spaceloft® AR5101, Spaceloft AR5102 and Spaceloft AR5103

MANUFACTURER: ASPEN AEROGELS, INC.
30 Forbes Road
Northborough, MA 01532

INFORMATION PHONE: 508- 691-1111 8 AM to 6 PM EST

EMERGENCY PHONE: (INFOTRAC) 800-535-5053 US
352-323-3500 INTERNATIONAL (call collect)

CHEMICAL FAMILY: Silica Aerogel Material

FORMULA: Proprietary

SECTION II: PRODUCT INGREDIENT

	CAS	EXPOSURE LIMITS	
		OSHA	ACGIH
Silica Gel (synthetic amorphous silica)	63231-67-4	None Established	
Poly (Ethylene Terephthalate)	25038-59-9	None Established	
Carbon Black	1333-86-4	3.5mg/m ³	

SECTION III: PHYSICAL/CHEMICAL CHARACTERISTICS

APPEARANCE: Black Silica Aerogel

ODOR: None

SPACIFIC GRAVITY: 0.12 g/cc

SOLUBILITY IN WATER: Insoluble

pH: Not Applicable

www.aerogel.com

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA:	Use media suitable for surrounding fire; normal fog nozzle water application and/or exclusion of air.
SPECIAL FIRE FIGHTING PREC:	Wear NIOSH/MSHA approved SCBA and full protective equipment.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	It may not be obvious that the product is burning unless stirred and sparks are apparent. Material that has been on fire should be watched closely for 48 hours to insure no smoldering material is present. Dust and powder may cause electrical shorts. Dust may be fine enough to penetrate electrical boxes unless tightly sealed.
DUST EXPLOSION POTENTIAL:	In special test procedures, with high dust concentrations and the application of a significant energy source, a carbon black/air mixture can explode. The following data has been determined for the concentrated carbon black: Minimum Ignition Energy: >1kJ, Minimum Ignition Temperature cloud: >546C.

SECTION V: REACTIVITY DATA

STABILITY:	Stable
CONDITIONS TO AVOID:	Contact with Strong Oxidizers
MATERIALS TO AVOID:	Reacts with Hydrogen Fluoride and Strong Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS:	Releases Carbon Monoxide (CO) and Carbon Dioxide (CO ₂) when burning.
HAZARDOUS POLY OCCUR:	None

SECTION VI: HEALTH HAZARD DATA

ROUTE OF ENTRY-INHALATION:	Yes
ROUTE OF ENTRY-SKIN:	No

ROUTE OF ENTRY-INGEST:

Yes

HEALTH HAZARD ACUTE AND CHRONIC:

Silica gel is a synthetic amorphous silica not to be confused with crystalline silica. Epidemiological studies indicate low potential for adverse health effects. Silica gel is considered by Davison to be a nuisance dust. In activated form, silica gel acts as a desiccant and can cause a drying irritation of mucous membranes and skin in cases of severe exposure. Not considered an ocular irritant.

Human Studies: Epidemiological studies of workers in the carbon black producing industries of North America and Western Europe show no evidence of clinically significant, adverse health effects due to occupational exposure to carbon black. Early studies in the former USSR and Eastern Europe report respiratory diseases among workers exposed to carbon black, including bronchitis, pneumoconiosis, emphysema, and rhinitis.

Animal Toxicity Studies: Carbon black contains less than 0.1% of absorbed PAH's (polynuclear aromatic hydrocarbons). In non-absorbed form, some PAH's have been found to be carcinogens in animal studies. No correlating carcinogenic effect, however, has been observed in humans due to exposure to carbon black. Chronic inflammation, lung fibrosis, and lung tumors have been observed in some rats experimentally exposed for long periods of time to excessive concentrations of carbon black.

CARCINOGENICITY – NTP:

No

CARCINOGENICITY – IARC:

Possibly

CARCINOGENICITY – OSHA:

No

EXPLANATION OF CARCINOGENICITY:

Many inhalation toxicologists believe that the tumor response observed in the referenced rat studies is species specific and does not correlate to human exposure. However, the IARC evaluation in Monograph 65 concluded that "there is sufficient evidence in experimental

animals for the carcinogenicity of carbon black". Based on this evaluation, along with their evaluation of inadequate evidence of carcinogenicity in humans, IARC's overall evaluation is that "carbon black is possibly carcinogenic to humans (Group 2B)".

**SIGNS/SYMPTOMS OF
OVEREXPOSURE:**

In activated form, silica gel acts as a desiccant and can cause a drying irritation of mucous membranes and skin in cases of severe exposure. Not considered an ocular irritant.

**MEDICAL CONDITION
AGGRAVATED BY EXPOSURE:**

None Known

**EMERGENCY/FIRST AID
PROCEDURE:**

Eye: Immediately wash with large amount of water for at least 15 minutes, occasionally lifting lids. If irritation occurs and persists, get medical treatment.

Skin: Wash with soap and water.

Ingest: Material will pass through the body normally.

Inhale: Remove to fresh air.

SECTION VII: PRECAUTIONS FOR SAFE ANDLING AND USE

**STEPS IF MATERIAL IS
RELEASED/SPILL:**

Not known to have any adverse affects on the aquatic environment. Material is insoluble and non-toxic. Sweep or vacuum up.

NEUTRALIZING AGENT:

None

WASTE DISPOSAL METHOD:

Dispose in an approved landfill IAW federal, state, and local regulation. Cover promptly to avoid blowing of dust.

**PRECAUTIONS-
HANDLING/STORING:**

When pouring into container of flammable liquid,ground both containers electrically to prevent static electric spark.

OTHER PRECAUTIONS:

Avoid prolonged breathing of dust, contact of dust with skin. Dying action can cause irritation of mucous membranes of nose and throat and irritation of skin. If use requires

material handling, wear long sleeves and close weave cotton or rubber gloves.

SECTION VIII: CONTROL MEASURES

RESPIRATORY PROTECTION:	If dusty conditions prevail, wear properly fitted NIOSH/MSHA approved dust respirator.
VENTILATION:	Local exhaust to control dust.
PROTECTIVE GLOVES:	Close-weave cotton or rubber gloves
EYE PROTECTION:	Chemical workers goggles
OTHER PROTECTIVE EQUIPMENT:	Long sleeves
WORK HYGIENIC PRACTICES:	None

SECTION IX: TRANSPORTATION DATA

DOT PROPER SHIPPING NAME:	Not regulated by this mode of transportation.
IMO PROPER SHIPPING NAME:	Not regulated by this mode of transportation.
IATA PROPER SHIPPING NAME:	Not regulated by this mode of transportation.
AFI PROPER SHIPPING NAME:	Not regulated by this mode of transportation.

SECTION X: DISPOSAL DATA

WASTE DISPOSAL METHOD:	Dispose in an approved landfill IAW federal, state, and local regulation. Cover promptly to avoid blowing of dust.
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SECTION XI: 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. Aspen Aerogels makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereon