



MATERIAL SAFETY DATA SHEET

REVISION DATE: March 24, 2004

SECTION I: MANUFACTURER AND MATERIAL

MATERIAL TRADE NAME: Pyrogel® AR5222 and Pyrogel AR5223

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 Composite

FORMULA: Proprietary

SECTION II: INGREDIENTS

	CAS	EXPOSURE LIMITS	
		OSHA	ACGIH
Silicon Dioxide (Amorphous Silica Gel)	7631-86-9		
Silica gel, trimethylsilylated	126877-03-0		
Amorphous Silica Fiber Felt	65997-17-3		
Zircon	14940-68-2		

SECTION III: PHYSICAL/CHEMICAL CHARACTERISTICS

APPEARANCE: White Silica Aerogel Blanket

ODOR: None

DENSITY: 0.10 g/cc - 0.12 g/cc

SOLUBILITY IN WATER: Insoluble

pH: Not Applicable

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SECTION IV: FIRE AND EXPLOSION HAZARD DATA

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 suitable for extinguishing this product in blanket form.

SPECIAL FIRE FIGHTING PREC:

Wear NIOSH/MSHA approved SCBA and full protective equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Rapid exposure of the product to excessive heat or flame can generate local concentrations of combustible vapors. 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.

DUST EXPLOSION POTENTIAL:

Surface treated silica gel materials are not a readily combustible or explosive substance. If dust clouds of particulates are generated from aggressive handling of the product, caution should be taken to avoid static discharges; ground all metal parts of cutting/processing equipment.

SECTION V: REACTIVITY DATA

STABILITY:

Stable

CONDITIONS TO AVOID:

Prolonged exposure to temperatures above the recommended use temperature. Avoid contact with fluorinating agents. Avoid conditions that produce large quantities of dust dispersed in air.

MATERIALS TO AVOID:

Reacts with hydrogen fluoride and hydrofluoric acid.

HAZARDOUS DECOMPOSITION PRODUCTS:

May release small amounts of ammonia, NO_x, carbon monoxide (CO) and carbon dioxide (CO₂) when heated to the decomposition point. Zircon can dissociate into zirconium oxide and silicon dioxide at temperatures above 1500 °C. Amorphous silicon dioxide can crystallize into hazardous respirable materials (*i.e.* cristobalite) after prolonged exposure to temperatures above 1200 °C.

HAZARDOUS POLYMERIZATION

INDICATOR: 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: None known for the product. Acute and chronic health hazard information is given for the ingredients below.

SILICON DIOXIDE: Amorphous silicon dioxide is often referred to as silica gel or amorphous precipitated silica. Amorphous silica should not be confused with crystalline silica. Epidemiological studies indicate low potential for adverse health effects. Silica gel is considered by NIOSH/OSHA to be a nuisance dust. In activated form, silica gel acts as a desiccant and can cause drying irritation of mucous membranes and skin in cases of severe exposure. It is not considered an ocular irritant. There is inadequate evidence in humans for the carcinogenicity of amorphous silica. There is inadequate evidence in experimental animals for the carcinogenicity of amorphous silica. Amorphous silica is not classifiable as to its carcinogenicity to humans (Group 3). (Amorphous Silica Gel)

ZIRCON (ZIRCONIUM SILICATE): May cause irritation if excessive exposure of the eyes or skin occurs. May cause respiratory tract irritation if dust is inhaled.

SILICA FIBER FELT: Handling of silica fiber felts may cause temporary skin, eye and upper respiratory tract irritation. Industry studies have shown textile grade fibrous silica to be a non-carcinogen.

CARCINOGENICITY – NTP: No

CARCINOGENICITY – IARC: No

CARCINOGENICITY – OSHA:	No
SIGNS/SYMPTOMS OF OVEREXPOSURE:	None known
MEDICAL CONDITION AGGRAVATED BY EXPOSURE:	None known
EMERGENCY/FIRST AID PROCEDURE:	<p>Eye: Immediately wash with large amounts of water for at least 15 minutes, occasionally lifting lids. If irritation occurs and persists, get medical treatment.</p> <p>Skin: Wash with soap and water immediately.</p> <p>Ingest: Material will pass through the body normally.</p> <p>Inhale: Remove to fresh air.</p>

SECTION VII: EXPOSURE LIMITS FOR COMPONENTS OF PRODUCT

THRESHOLD LIMIT VALUE/ PERMISSIBLE EXPOSURE LIMIT:	Not known for composite structure. See below for recommended TLV/PEL for components.
SILICON DIOXIDE:	NIOSH recommends a 10-hour time weighted average of 6-mg/cu m. ACGIH offers a Threshold Limit Value (TLV) of 10-mg/cu m. An ILDH limit has been set by NIOSH to be 3000 mg/m ³ .
ZIRCON:	OSHA has established a permissible exposure limit (PEL) of 8-hr time weighted average of 5 mg/m ³ of respirable dust and 15 mg/m ³ of total dust for zircon (zirconium silicate).
SILICA FIBER FELT:	The OSHA PEL for vitreous silica fiber is 5 mg/m ³ of respirable dust and 15 mg/m ³ of total dust. The ACGIH offers a TLV of 1 fiber per cm ³ for fibers longer than 5 microns with a diameter less than 3 microns and 5 mg/m ³ for respirable dust. The silica fiber felt used in this product has an average fiber diameter larger than 5 microns.

SECTION VIII: PRECAUTIONS FOR SAFE HANDLING 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:	Avoid conditions that generate large quantities of dust. Ground metal containers and tools used to handle the product.
OTHER PRECAUTIONS:	Avoid prolonged breathing of dust, contact of dust with skin. Drying action can cause irritation of mucous membranes of nose and throat and irritation of skin. If use requires material handling, wear long sleeves and rubber gloves. Hands should be washed thoroughly after handling.

SECTION IX: CONTROL MEASURES

RESPIRATORY PROTECTION:	None usually required. If dusty conditions prevail, wear properly fitted NIOSH/MSHA approved dust respirator.
VENTILATION:	Local exhaust to control dust.
PROTECTIVE GLOVES:	Latex or other rubber gloves (close weave cotton gloves may also suffice).
EYE PROTECTION:	Safety goggles
OTHER PROTECTIVE EQUIPMENT:	Long sleeves
WORK HYGIENIC PRACTICES:	None

SECTION X: 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 XI: DISPOSAL DATA

WASTE DISPOSAL METHOD:

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

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.