FIBERMAX® MULLITE MAT SE Effective Date: 09/18/1997
MSDS No. M0110

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: **FIBERMAX® MULLITE MAT SE**
Chemical Name: POLYCRYSTALLINE ALUMINOSILICATE FIBERS
Synonym(s): Polycrystalline fiber, refractory fiber, mullite synthetic vitreous fiber (SVF), man-made vitreous fiber (MMVF)
Grade(s): Not Applicable

Manufacturer/Supplier: **Unifrax Corporation**
2351 Whirlpool St.
Niagara Falls, NY 14305-2413

Product Stewardship Information Hotline
1-800-322-2293 (Monday - Friday 8:00 a.m. - 4:30 p.m. EST)

CHEMTREC Assist: **1-800-424-9300**

Effective Date: 09/18/1997 Supersedes: 04/08/96 Print Date: 09/18/1997

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS Number	% by Weight
Aluminosilicate fiber (polycrystalline)	1302-93-8	90-95
Polyethylene film	9002-88-4	5-10

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING! POSSIBLE CANCER HAZARD BY INHALATION. MAY CAUSE SKIN, EYE, AND RESPIRATORY TRACT IRRITATION. MAY BE HARMFUL IF INHALED. HAZARD DEPENDS ON DURATION AND LEVEL OF EXPOSURE. WHITE ODORLESS FIBROUS MAT ENCAPSULATED IN POLYETHYLENE FILM.

HAZARD RATINGS

National Fire Protection Association (NFPA) Ratings:
Health: 1 Flammability: 0 Reactivity: 0

Hazardous Materials Information System (HMIS) Ratings:
Health: 1* Flammability: 0 Reactivity: 0 Personal Protection Index: X

POTENTIAL HEALTH EFFECTS

Target Organs:
Skin, eyes, and lungs.

Inhalation:
If inhaled in sufficient quantity, may cause respiratory tract irritation. Symptoms may include scratchiness of the nose or throat, cough or chest discomfort.

Eye Contact:
Slightly to moderately irritating. Fibers may be abrasive; prolonged contact

may cause damage to the outer surface of the eye.

Skin Contact:
Slightly to moderately irritating. Exposure may result in irritation, inflammation, rash or itching.

Ingestion:
If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include nausea, vomiting, or abdominal pain.

Chronic Effects:
Polycrystalline aluminosilicate fibers have not been specifically classified. However, the Seventh Annual Report on Carcinogens (1994), prepared by the National Toxicology Program (NTP), classified respirable RCF and glasswool as substances reasonably anticipated to be carcinogens. The International Agency for Research on Cancer (IARC) has classified ceramic fiber, fibrous glasswool and mineral wool (rockwool and slagwool) as possible human carcinogens (Group 2B) based on sufficient evidence of carcinogenicity in animals, but insufficient data in humans. IARC has also classified respirable crystalline silica, a possible byproduct of aluminosilicate fiber devitrification following sustained, high-temperature (>1800°F) use, as a substance known to be carcinogenic to humans (Group 1). See Sections 11 & 16 of this MSDS for more information.

Medical Conditions Aggravated by Exposure:
Pre-existing medical conditions, including dermatitis, asthma or chronic lung disease may be aggravated by exposure; individuals who are atopic (with a history of allergies) may experience greater amounts of skin and respiratory irritation.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:
If respiratory tract irritation occurs, relocate individual to a dust free environment. Get medical attention if irritation persists. See Section 8 for additional measures to reduce or eliminate exposure.

Eye Contact:
If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes. Get medical attention if irritation persists.

Skin Contact:
If skin becomes irritated, remove contaminated clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.

Ingestion
If gastrointestinal irritation occurs, relocate individual to a dust free environment. Seek medical attention if symptoms persist.

NOTES TO PHYSICIANS
Skin and respiratory effects are the result of mechanical irritation; fiber exposure does not result in allergic manifestations.

5. FIRE FIGHTING MEASURES

Flammable Properties:
Flashpoint: None.
Method: N. App

Flammable Limits:
Lower Flammable Limit: N. App.
Upper Flammable Limit: N. App.

Autoignition Temperature:
None.

Hazardous Decomposition Products:
Decomposition products may include acrolein, formaldehyde, carbon monoxide, and carbon dioxide.

Extinguishing Media:

Use extinguishing media suitable for type of surrounding fire.

Fire Fighting Instructions:
See "Extinguishing Media" above.

Unusual Fire and Explosion Hazard:
None.

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures:
Use vacuum suction with HEPA filters to clean up spilled material. Use wet sweeping or a dust suppressant where sweeping is necessary.

7. HANDLING AND STORAGE

Handling and Storage:
Handle polycrystalline fiber with caution. Minimize airborne dusts by avoiding the unnecessary disturbance of materials.

Prolonged exposure to high temperatures generally increases the relative friability of aluminosilicate fibers.

Removal and clean up of after service product may result in exposure to a mixture of crystalline phase silica and fiber. Depending on the product's use, other contaminants may also be present. During removal, the exposed material should be frequently misted with water to minimize airborne dust. A surfactant may be added to the water to improve the wetting process. Use only enough water to wet the insulation. Do not allow water to accumulate on floors.

Clean Up
Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming is used the vacuum must be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning. Dust suppressing compounds may be used to clean up light dust.

For additional information regarding the use and handling of this product, contact the Unifrax Corporation Product Stewardship Information Line at 1-800-322-2293 (See Section 16).

Empty Containers:
Product packaging may contain residue. Do not reuse.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES

Components	OSHA (PEL)	ACGIH (TLV)	SUPPLIER
Aluminosilicate fiber (polycrystalline)		None Established	None Established
1 fiber/cc 8-hr			TWA*
Polyethylene film	None Established	None Established	

* No OSHA or ACGIH exposure limits have been established for these materials. Pending the results of long-term health effects studies, airborne exposures should be controlled at or below the Recommended Exposure Guidelines listed above.

ENGINEERING CONTROLS

Dust suppressing control technologies such as local exhaust ventilation, point of

generation dust collection, down draft work stations, emission controlling tool designs, and materials handling equipment are effective means of minimizing airborne fiber emissions. For additional information, contact the Unifrax Corporation Product Stewardship Information Hotline at 1-800-322-2293 (See Section 16).

PERSONAL PROTECTION EQUIPMENT

Respiratory Protection:
Aluminosilicate Fiber

When engineering and/or administrative controls are insufficient, the use of appropriate respiratory protection, pursuant to the requirements of OSHA 1910.134, is recommended. The following information is provided as an example of appropriate respiratory protection for aluminosilicate fibers. The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a case by case basis, by a qualified Industrial Hygienist.

Airborne Fiber Concentration	Respiratory Protection
1 to 10 respirable f/cc	NIOSH approved, half-mask, air purifying respirator equipped with a high-efficiency particulate air (HEPA) filter cartridges
10 to 50 respirable f/cc	NIOSH approved, full face-piece, air purifying respirator equipped with a high-efficiency particulate air (HEPA) filter cartridges
50 to 100 respirable f/cc	Full facepiece, positive pressure supplied air respirator

Skin Protection:
Wear gloves, head coverings and full body clothing as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. Work clothes should be washed separately from other clothing and the washing machine rinsed thoroughly following use. Inform the launderer of the proper procedures. Store work clothes and street clothes separately to prevent contamination.

Eye Protection:
Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses unless chemical goggles are also worn. Do not touch eyes with contaminated body parts or materials. Have eye washing facilities readily available where eye contact can occur.

See Section 16 regarding handling considerations for after service aluminosilicate fiber.

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor and Appearance: White, odorless fibrous mat encapsulated in polyethylene film.
Chemical Family: Polycrystalline aluminosilicate fibers

Boiling Point:	N. App.	% Solubility in Water:	N. App.
Melting Point:	1760° C (3200° F)	Specific Gravity:	N. App.
Vapor Pressure:	N. App.	pH:	N. App.
Vapor Density (Air = 1):	N. App.	% Volatile:	N. App.
Molecular Weight:	N. App.	Molecular Formula:	$3Al_2O_3.2SiO_2$

10. STABILITY AND REACTIVITY

Chemical Stability:
Stable under conditions of normal use.

Incompatibility:
Soluble in hydrofluoric acid, phosphoric acid, and concentrated alkali.

Conditions to Avoid:
None.

Hazardous Decomposition Products:
Decomposition products may include acrolein, formaldehyde, carbon monoxide, and carbon dioxide.

Hazardous Polymerization
Not Applicable.

11. TOXICOLOGICAL INFORMATION

Mullite is produced as a synthetic, aluminosilicate, polycrystalline fiber. To date, no specific testing of Fibermax® Mullite Fiber has been done. Many other fiber compositions have been tested extensively. The information provided below describes the data available for another aluminosilicate, but vitreous, fiber product -- refractory ceramic fiber -- which suggests that it would be prudent to exercise appropriate caution when handling this product.

The existing toxicology and epidemiology data bases for RCF's are based on ongoing studies. The Unifrax Corporation supports ongoing investigations and will make all data available to interested parties upon request. Information will be updated as studies are completed and reviewed. The following is a summary of the results to date:

EPIDEMIOLOGY

Employees engaged in manufacturing Fibermax® Mullite Fibers are subject to an ongoing medical surveillance program. To date, no relationship has been identified between exposure to Fibermax® Mullite Fibers and respiratory disease in humans. Regarding another form of aluminosilicate fiber, there are no known published reports which link refractory ceramic fiber exposure to clinical disease in humans. An epidemiologic investigation, being conducted by the University of Cincinnati, of RCF production workers in the U.S. is ongoing. The evidence obtained from employees in U. S. RCF manufacturing facilities, is as follows:

1) There is no evidence of any fibrotic lung disease (interstitial fibrosis) on x-ray.

2) There is no evidence of an elevated incidence of lung disease among RCF manufacturing employees who were exposed to RCF.

3) In the exposed population, a statistical "trend", comparing initial test results to predicted norms as based on breathing tests, was observed between the duration of exposure to RCF and a decrease in some measures of pulmonary function. The observations are considered to be statistically significant, but clinically insignificant. In other words, if these observations were made on an individual employee, the results would be interpreted as being within the normal (predicted) respiratory range.

4) The initial data indicates that the decrease in pulmonary function appears to be greater in employees who smoke. RCF exposure and smoking behavior seem to be negatively synergistic; in other words, RCF-exposed smokers seemed to show a greater decrease in respiratory function than would be produced by combining the average decrease observed from RCF-exposure only and smoking behavior only.

5) Pleural plaques, which are discrete areas of pleural thickening usually on the parietal pleura or diaphragm, have been observed in a small number of RCF employees. There appears to be a dose-response relationship between the occurrence of pleural plaques on chest radiographs and the following variables: a) years since RCF production hire date; b) duration of RCF production employment; and c) cumulative RCF exposure. The best evidence to date indicates that pleural plaques are a marker of exposure only. There is virtually no evidence to suggest that pleural plaques are a precursor mechanism of respiratory conditions such as interstitial fibrosis, lung cancer, or mesothelioma. Under most circumstances, pleural plaques are not associated with pulmonary impairment. The pathogenesis of pleural plaques remains incompletely understood; however, the mechanism appears to be an inflammatory response caused by inhaled fibers transported via lymphatics to the subpleural area.

TOXICOLOGY

No specific toxicology studies, designed to expose test animals to Fibermax® Mullite Fiber, have been undertaken to date. Other forms of aluminosilicate fiber, including RCF, contain fibers of different sizes, some of which are small enough to be respirable by humans. Scientists have been conducting research since the 1950's to determine the potential risks for adverse health effects which may result from fiber inhalation.

In 1987 the International Agency for Research on Cancer (IARC) classified man-made vitreous fibers including glasswool, rockwool, slagwool, and RCF as possible human carcinogens (2B). More recently, the U.S. Department of Health and Human Services classified the respirable fibers of glasswool and RCF as "substances which may reasonably be anticipated to be carcinogens" (National Toxicology Program, 7th Annual Report on Carcinogens, 1994).

To date, a number of toxicological studies have been conducted which utilize non-physiological exposure methods such as intrapleural, intraperitoneal and intratracheal implantation or injection. Some of these studies concluded that RCF is a potential carcinogen. Some experts, however, suggest that these tests have limited relevance because they bypass many of the biological mechanisms which prevent fiber deposition or facilitate fiber clearance.

Other toxicological studies utilizing a physiological exposure method, inhalation, have produced findings of respiratory disease in rodents. The most recent RCF-inhalation studies were conducted at the Research and Consulting Company, Geneva, Switzerland. Rats and hamsters were exposed, using a nose-only inhalation system, to the "maximum tolerated dose" of 30 mg/m^3 (about 200 fibers/cc) of specially-prepared RCF for 6 hours/day, 5 days/week, for up to 24 months. In another research effort, other rats were exposed, in a multi-dose study with a similar protocol, to doses of 3 mg/m^3, 9 mg/m^3, and 16 mg/m^3, which corresponds to about 25, 75, and 115 fibers/cc.

No acute respiratory effects were seen in the rats in the 3 mg/m^3 exposure group. Some cases of mild parenchymal fibrosis and one mesothelioma were observed in the 9 mg/m^3 group. Some cases of pleural and parenchymal fibrosis were seen in the 16 mg/m^3 and in the 30 mg/m^3 exposure group. In addition to a statistically significant increase in lung tumors, two mesotheliomas were also observed in the 30 mg/m^3 group. Hamsters, exposed to only the highest dose, did not develop lung tumors. However, a moderate amount of interstitial fibrosis was seen, as well as a 42% incidence rate of mesothelial tumors.

These studies have found RCF to be a rodent carcinogen, under the conditions of lifetime exposure at high doses. These studies suggest that there may be a dose/response threshold, below which irreversible respiratory impacts do not occur.

To obtain more epidemiology or toxicology information, please call the toll free telephone number for the Unifrax Corporation Product Stewardship Program found in Section 16 - Other Information.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information: No data available.

Distribution: No data available.

Chemical Fate Information: No data available.

13. DISPOSAL CONSIDERATIONS

Disposal:
Aluminosilicate fiber is not classified as a hazardous waste according to Federal regulations (40 CFR 261). Check local, regional, state or provincial regulations for applicable requirements for disposal. Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the generator's responsibility to determine if a waste is a hazardous waste.

Empty Containers:
Product packaging may contain product residue. Do not reuse.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

BILL OF LADING DESCRIPTION (49 CFR 172.202):

FIBERMAX® MULLITE MAT SE (NON-REGULATED)

15. REGULATORY INFORMATION

Key statutory and regulatory classifications or listings for the product, as manufactured, which may impact product storage, use, handling or disposal:

U.S. FEDERAL REGULATIONS

Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA):

Constituents regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA 40 CFR 302):

Constituent	RQ in Pounds
NONE	

This product is composed of polycrystalline fiber with an average diameter greater than 1 micron, and therefore is not considered CERCLA hazardous substance. See 60 FR 30934 (June 12, 1995).

Clean Air Act (CAA):
Substances regulated as hazardous air pollutants under Section 112 of the Clean Air Act Amendments of 1990:

Chemical Name
NONE

This product is composed of polycrystalline fiber with an average diameter greater than 1 micron, and therefore is not considered a hazardous air pollutant. See 60 FR 30934 (June 12, 1995).

Toxic Substances Control Act (TSCA):
All substances in this product are listed, as required, on the TSCA inventory. Refractory ceramic fiber has been assigned a CAS number; however, it is a simple mixture and therefore not required to be listed on the TSCA inventory.

This product contains a polycrystalline fiber which may be subject to an EPA TSCA Section 5(e) Consent Order and may be subject to TSCA Section 12(b) Export Notification requirements. Monitoring of airborne workplace fiber concentrations is being conducted under the consent order. For more information on this program, contact the Unifrax Corporation Product Stewardship Information Line at 1-800-322-2293 (See Section 16).

Superfund Amendments and Reauthorization Act (SARA) Title III Information:
SARA Hazard Category:
Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA)Section 311/312 (40 CFR 370):

Immediate Hazard:	--	Fire Hazard:	--
		Reactivity Hazard:	--
Delayed Hazard:	X	Pressure Hazard:	--

SARA 313 Information:

Toxic chemical(s) subject to the annual reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372):

Chemical Name	CAS Number	Concentration
NONE		

EPA has proposed to place man-made mineral fibers, including RCF, on the list of substances subject to the annual TRI reporting requirements, but a final listing decision has been deferred indefinitely. See 59 FR 61439 (November 30, 1994).

SARA 302/311/312 Information:
Extremely hazardous substances subject to the notification and inventory reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 302 (40 CFR 355) and Section 311/312 (40 CFR 370) respectively:

Chemical Name	CAS Number	Concentration
NONE		

STATE REGULATIONS

California:
Substance(s) listed by the State of California on Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986:

Chemical Name	CAS Number
NONE	

New Jersey:
Chemical(s) which are listed as a special health hazard substance as defined in New Jersey Worker and Community Right to Know Act, New Jersey Administrative Code, Title 8, Department of Health, Chapter 59, Subchapter 10:

Chemical Name	CAS Number
NONE	

Pennsylvania:
Chemical(s) which are listed as a special health hazard substance as defined in Pennsylvania Right-to-Know Law, Section 3800:

Chemical Name	CAS Number
NONE	

INTERNATIONAL REGULATIONS

Canadian Workplace Hazardous Materials Information System (WHMIS):
The following Canadian Workplace Hazardous Materials Information System (WHMIS) categories apply to this product:

Compressed Gas: -- Flammable/Combustible: -- Oxidizer: --
Acutely Toxic: --
Other Toxic Effects: X Biohazardous: -- Corrosive: ---
Dangerously Reactive: --

Canadian Environmental Protection Act (CEPA):
All substances in this product are listed, as required, on the Domestic Substances List (DSL).

Chemical(s) which are listed on the Non-Domestic Substances List:

Chemical Name	CAS Number
NONE	

16. OTHER INFORMATION

After Service RCF: Removal

As manufactured, this product is a polycrystalline aluminosilicate which does not contain respirable silica. However, following sustained, high temperature (>1800°F) use, it is possible for portions of the exposed fiber to devitrify into mullite or cristobalite (a form of crystalline silica). Chronic exposure to respirable crystalline silica may lead to lung disease. IARC has concluded that: "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." [IARC Monograph 68, June 1997, p. 210-211]. The Occupational Safety and Health Administration (OSHA) has adopted a permissible exposure limit (PEL) for respirable cristobalite at 0.05 mg/m^3. When needed, the use of proper exposure controls and respiratory protection is recommended to reduce potential health risks and to ensure compliance with OSHA requirements. The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed, on a cases by case basis, by a qualified Industrial Hygienist. For more detailed information regarding respirable crystalline silica, call the Product Stewardship Information Hotline (see below).

Product Stewardship Program

The Unifrax Corporation has established a program to provide customers with up-to-date information regarding the proper use and handling of refractory ceramic fiber. In addition, Unifrax Corporation has also established a program to monitor airborne fiber concentrations at customer facilities. If you would like more information about this program, please call the Unifrax Corporation Product Stewardship Information Hotline at 1-800-322-2293.

Revision Summary: Sections 2, 3, 4, 6, 7, 11, 13, 15 -- Minor changes. Section 16 -- Revised.

MSDS Prepared By: UNIFRAX HSEQ DEPARTMENT

DISCLAIMER

The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

More Unifrax High Temperature Insulation Information On The Web:

Official Unifrax High Temperature Insulation Website	http://www.unifrax.com
Unifrax High Temperature Insulation Information	http://www.high-temperature-insulation.com
Unifrax Refractory Ceramic Fiber Information	http://www.refractory-ceramic-fiber.com
Official Fiberfrax Refractory Ceramic Fiber High Temperature Insulation Information	http://www.fiberfrax.com
Official Foamfrax Advanced High Temperature Insulation Information	http://www.foamfrax.com
Official Insulfrax Soluble Fiber High Temperature Insulation Information	http://www.insulfrax.com
Official Isofrax Soluble Fiber High Temperature Insulation Information	http://www.isofrax.com
Official Fyrewrap Fire Prevention Products Information	http://www.fyrewrap.com