MACON BUILDING
CONSTRUCTION IS OUR BUSINESS
EST. 1987

SUBMITTAL

Contractor's Stamp:	Notes:
SHOP DRAWING / SUBMITTAL REVIEW: [X] APPROVED [ ] APPROVE WITH CHANGES NOTED [ ] REVISE AND RESUBMIT [ ] REJECTED Submittal was reviewed for design conformity and general conformance to Contract Documents only. The Subcontractor is responsible for confirming and correlating dimensions at jobsite for the tolerance, clearance, quantities, fabrication processes and techniques of construction. Coordination of His/Her work with other trades and full compliance with Contract Documents. BY: Tony Cannon MACON BUILDING PROJECT MANAGER MACON BUILDING 662 HIGHLAND DRIVE - ALTAMONTE SPRING - FL - 32701	"PLEASE USE REDTEAM FOR NOTES"

Architect's Stamp:	Notes:
	"PLEASE USE REDTEAM FOR NOTES"

Engineer's Stamp	Notes:
WTA, INC. CONSULTING ENGINEERS ✓ APPROVED ____ APPROVED AS NOTED ____ NOT APPROVED ____ REVISE AND RE-SUBMIT REVIEWED AS AN AID TO THE CONTRACTOR ONLY. CONTRACTOR IS NOT RELIEVED OF RESPONSIBILITY FOR FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS. DATE: 11.06.2020 BY: Mark Martinez	"PLEASE USE REDTEAM FOR NOTES"

SAFETY DATA SHEET

SDS No: 0018

Section 1. Product and Company Identification

Product Name: LaserMax®

Trade Name: Film-stamped Impact Modified Acrylic

Recommended Use: Signage, Other

Restrictions on Use: None

Manufacture:	Rowmark 5409 Hamlet Drive Findlay, OH 45840	In Case of Emergency:	Medical:911 Call: Poison Control: 800-589-3897 Email:
		Information:	Call: 1-877-ROWMARK Email: techhelp@rowmark.com

Section 2. Hazard Identification

GHS Classification: Not Classified

GHS Label Elements: Not Applicable

GHS Rating

Health	5
Flammability	4
Instability	5
Special	

NEW GHS Hazard Categories
Category 1 = Severe Hazard
Category 2 = Serious Hazard
Category 3 = Moderate Hazard
Category 4 = Slight Hazard
Category 5 = Minimal Hazard

Other Hazards: Not Applicable

Section 3. Composition / Information on Ingredients

Name	CAS #	% by Weight	OHSA
P (EA/MMA)	Proprietary	50-54	N
Acrylic Styrene Copolymer	Proprietary	35-50	N
Methyl methacrylate	80-62-6	< 0.5	Y
Ethyl acrylate	140-88-5	< 0.1	Y
Aluminium Flake	7429-90-5	1-5	
Carbon Black	1333-86-4	1-5	
Copper	7440-50-8	1-2	

The substance(s) marked with a "Y" in the OSHA column are idenfitied as hazardous chemicals according to the criteria of the OSHA Hazardous Communication Standard (29 CFR 1910.1200).

While this material is not classified as hazardous under Federal OSHA regulations, this SDS contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

The components of this product are all on the TSCA Inventory list.

* Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits.

Section 4. First Aid Measures

Inhalation:	Dust and process vapors may be irritation to the nose, throat and respiratory tract. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get Medical attention.
Eyes:	Dust, fines and process vapors may irritate the eyes. Immediately flush eyes with water for at least 15 minutes. Get medical attention.
Skin:	Exposure to molten plastic may cause thermal burns. If molten material comes in contact with the skin, cool under ice water or a running stream.
Ingestion:	No adverse health effects expected from ingestion.

Section 5. Fire-Fighting Measures

Suitable Extinguishing Methods:	Dry Chemical, Water Spray, Foam Carbon Dioxide. Avoid using direct streams of water on molten burning material.
Unsuitable Extinguishing Methods:	NONE known.
Hazards During Fire-fighting:	Carbon monoxide, carbon dioxide, original monomer other hydrocarbon oxidation products.
Protective Equipment:	Wear self-contained breathing apparatus and protective suit.

Section 6. Accidental Release Measures

Personal Precautions:	See Section 8 - Exposure Controls / Personal Protection.
Environmental Precautions:	No Special environmental precautions required.

Methods and Materials for Containment and Cleaning Up

Spill / Leak:	Containment of this material should not be necessary. Sweep up or gather material and place in appropriate container for disposal.

Section 7. Handling and Storage

Handling:	Keep away from heat, flame and strong oxidizing agents.
Storage:	Keep away from heat, sparks, and flame. Store in cool place in original container and protect form sunlight.

Section 8. Exposure Control and Personal Protection

Exposure Limits:

1) Effects of Acute Exposure:	Inhalation of vapors may result in irritation of upper respiratory tract
2) Effects of Chronic Over Exposure:	

3) OSHA Permissible Exposure Limits:

US. ACGIF Threshold Limit Values

Form:	Inhalable particles
Time weighted average	10 mg/m3
Form:	Respirable particles
Time weighted average	3 mg/m3

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Form:	Respirable fraction
PEL:	5 mg/m3
Form:	Total dust
PEL:	15 mg/m3

US. OSHA Table Z-3 (29 CFR 1910.1000)

Form:	Respirable fraction
Time weighted average	15 ppm
Form:	Total dust
Time weighted average	50 ppm
Form:	Respirable fraction
Time weighted average	5 mg/m3
Form:	Total dust
Time weighted average	15 mg/m3

4) Carcinogen Potential:

Engineering Controls:

Use recommended safe handling practices to minimize unnecessary exposure.

General room ventilation is adequate for storage and ordinary handling.

Use local exhaust at points of fume generation or if dusty conditions prevail.

Personal Protective Equipment:

Wear safety glasses with side shields or chemical goggles to prevent eye contact.

Have eye-washing facilities readily available where eye contact can occur.

Wear impervious gloves and protective clothing to prevent skin contact.

Section 9. Physical and Chemical Properties

Appearance:	Various Colors	Vapor Pressure:	Not Applicable
Odor:	Slightly acrylic	Vapor Density:	Not Applicable
pH:	Not applicable	Relative Density:	1.19 g/cm3
Melting Point / Freezing Point:	No data available	Solubility (ies):	Not Applicable
Boiling Point:	No data available	Partition Coefficient ($_{\text{N-Octanol/Water}}$):	No data available
Flash Point:	Not applicable	Auto-Ignition Temperature:	739°F (393°C)
Evaporation Rate:	Not applicable	Decomposition Temperature:	>572°F (> 300°C)
Flammability (solid, gas):	See GHS in section 2	Viscosity:	No data available
Upper Explosive Limit:	Not applicable	Specific Gravity:	1.19 Water = 1 (liquid)
Lower Explosive Limit:	Not applicable	Percent Volatile:	0%

Section 10. Stability Reactivity

Reactivity:	No data available
Chemical Stability:	Stable
Possibility of Hazardous Reactions:	Hazardous polymerization does not occur
Conditions to Avoid:	Avoid flames, welding arcs, potential ignition sources, or other high temperature sources, prolonged contact with acids, alkalis and strong oxidizing agents
Incompatible Materials:	None under normal conditions of use
Hazardous Decomposition Products:	Carbon oxides, Acrylates, Methacrylates, Hazardous organic compounds
Combustion Products:	No data available

Section 11. Toxicological Information

Irritation Effects

Eye Irritation:	Solid particles may cause transient irritation from mechanical abrasion.
Skin Irritation:	Not expected to cause skin irritation. Molten material may cause thermal burns.
Inhalation:	Not a likely route of exposure. Process fumes may cause irritation.
Ingestion:	May cause a choking hazard if swallowed.

Data for PLEXIGLAS® DR®-101 ACRYLIC RESIN

Acute Toxicity

Dermal:	Acute toxicity estimate > 5,000 mg/kg
Inhalation:	4 h Acute toxicity estimate > 10 mg/L

Data for Acrylic copolymers (Proprietary)

Other Information

The information presented is from representative materials in this chemical class. The results may vary depending on the test substance.

Effects due to processing releases or residual monomer: Possible cross sensitization with other acrylates and methacrylates.

Data for Acrylic styrene copolymers (proprietary)

Other Information

The information presented is from a representative material with a similar structure. The results vary depending on the size and composition of the test substance.

Effects due to processing releases or residual monomer: Possible cross sensitization with other acrylates and methacrylates.

Additional Toxicological Information

When used and handled according to specifications, the product does not have any harmful effects according to research and information provided by suppliers.

Carcinogenic Effect

International Agency for Research on Cancer (IARC) : Group3 NOT classifiable as to its carcinogenicity to humans.

Section 12. Ecological Information

Eco-toxicity:	Toxicity to fish - No relevant studies identified.
Persistence and Degradability:	This material is not expected to be readily biodegradable.
Bio-accumulate Potential:	Product is not likely to accumulate in biological organisms.
Mobility in Soil:	This Product has not been found to migrate through soils.
Other Adverse Effects:	This Substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

Section 13. Disposal Considerations

Disposal Methods

Product Recommendation:

1. Recycle (Reprocess) if product has not been contaminated so as to make it unsuitable for its intended use.
2. Disposal through controlled incineration or authorized waste dump in accordance with Local, State or Federal Regulations.

Uncleaned Packaging Recommendation:

1. Disposal must be done in accordance with Local, State, or Federal Regulation.

Section 14. Transportation Information

UN Number:	Not Relevant
UN Proper Shipping Name:	Not Relevant
Transportation Hazard Class(es)	
DOT:	Not Regulated/classified
ADR / RID:	Not Regulated/classified
IMDG:	Not Regulated/classified
ICAO/IATA	Not Regulated/classified
Packing Group:	Not Applicable
Environmental Hazards:	Not Relevant
Transportation in Bulk (According to Annex II of MARPOL 73/78 and IBC Code):	Not Relevant
Special Precautions for User:	No special precautions

Section 15. Regulatory Information

(Not meant to be all-inclusive -- selected regulations represented)

Hazard categories under criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	N	Delayed (Chronic) Health	N
Sudden Release of Pressure	N	Reactive	N
Fire	N		

The components of this product are all on the TSCA inventory list.

INGREDIENT RELATED REGULATORY INFORMATION:

	SARA REPORTABLE QUANTITIES	CERCLA RQ	SARA TPQ
	Ethyl acrylate	1000 LBS	N/A
	Methyl methacrylate	1000 LBS	N/A

	P (EA/MMA)	N/A	N/A

SARA TITLE III, SECTION 313

This product does contain chemical(s), which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See section 2.

Chemical Name	CAS-No.	De minimis concentration	Reportable Threshold:
Ethyl acrylate	Not assigned	Not assigned	Not assigned
Methy methacrylate	Not assigned	Not assigned	Not assigned
Aluminium	Not assigned	Not assigned	Not assigned
Copper	Not assigned	Not assigned	Not assigned
2-Propenoic acid, ethyl ester	140-88-5	0.10%	10000 lbs (otherwise used (non-manufacturing/processing)) 25000 lbs (manufacturing and processing)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-Reportable Quantity (RQ)

Chemical Name	CAS-No.	Reportable quantity
2-Propenoic acid, 2-methyl-, methyl ester	80-62-6	1000 lbs
2-Propenoic acid, ethyl ester	140-88-5	1000 lbs

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
United States TSCA Inventory	TSCA	The components of this product are all on the TSCA Inventory
Canadian Domestic Substnaces List (DSL)	DSL	All components of this product are on the Canadian DSL.
China. Inventory of Existing Chemical Substances in China (IECSC)	IECSC (CN)	Does not conform
Japan. ENCS - Existing and New Chemical Substances Inventory	ENCS (JP)	Does not conform
Japan. ISHL-Inventory of Chemical Substances	ISHL (JP)	Does not conform
Korea. Korean Existing Chemicals Inventory	KECI (KR)	Conforms to
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	PICCS (PH)	Conforms to
Australia Inventory of Chemical Substances	AICS	Conforms to

Section 16. Other Information

No Additional Information

NOTICE: The information presented in this Safety Data Sheet is based on data considered to be accurate as of the date this Safety Data Sheet was prepared. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In additional, 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.

Revision Date: March 7, 2017

OSHA HazCom:	This Material is not Hazardous b OSHA Hazardous Communication Standard 29 CFR 1910.1200	
SARA 313:		
Immediate Hazard: NO	**Fire Hazard**: NO	**Reactivity Hazard**: NO
Delayed Hazard: NO	**Pressure Hazard**: NO	

Section 16. Other Information

No Additional Information

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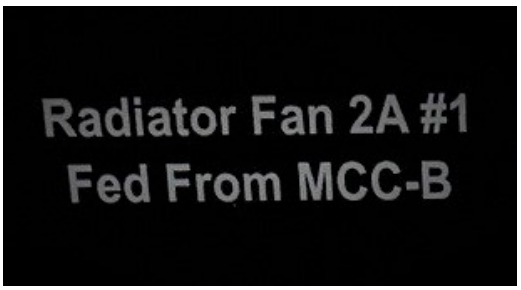
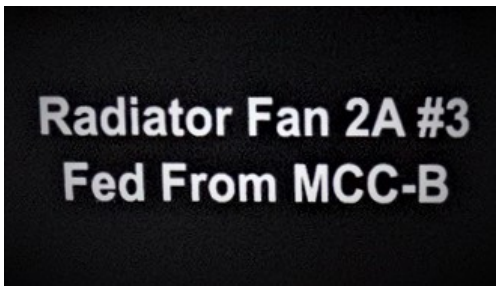
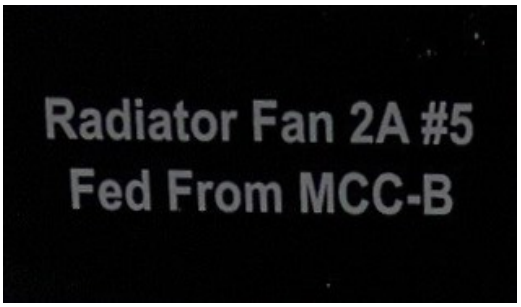
Revision Date:

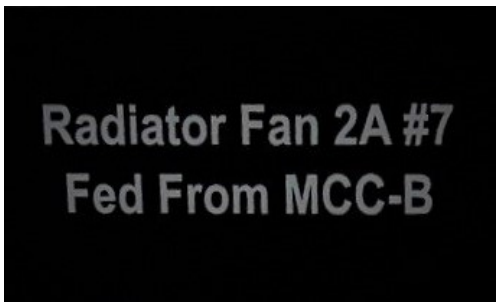
MACON BUILDING
662 Highland Drive
Altamonte Springs, FL 32701
407.339.1188

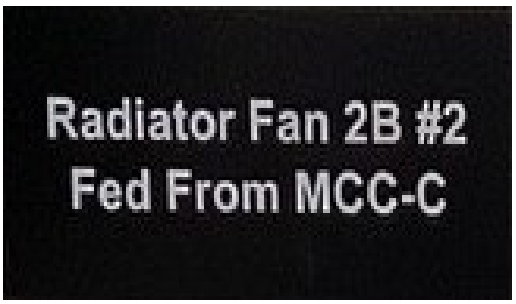
Project Name:	Verizon Generator Radiators Replacement Temple Terrace Center
Project Address:	7701 East Telecom Parkway, Temple Terrace, FL 33673
Project #:	1260003
Subject:	**Signage Submittal**
Radiator:	#2

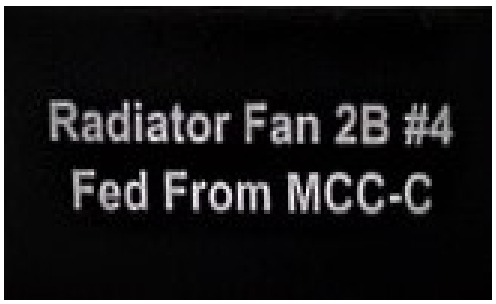


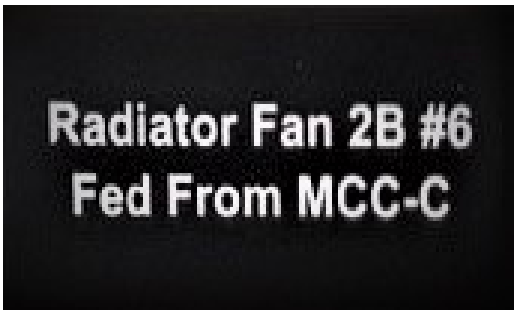


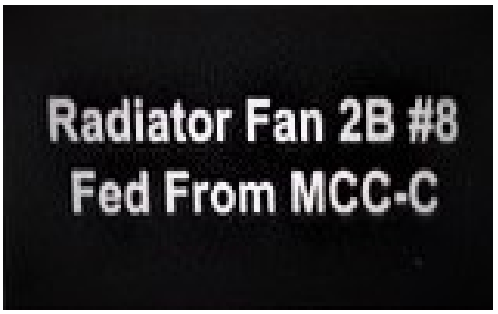






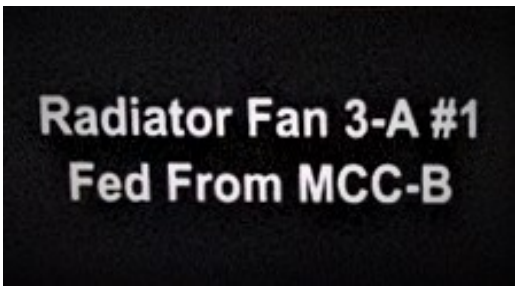


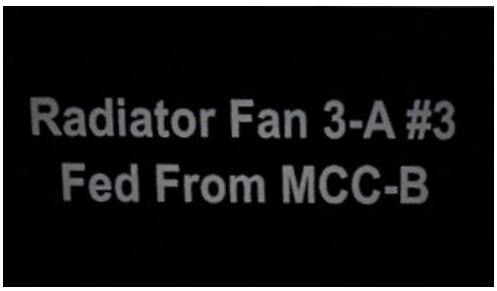


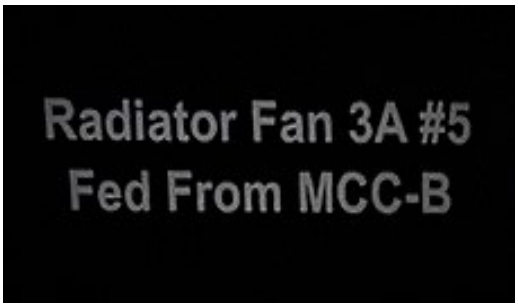


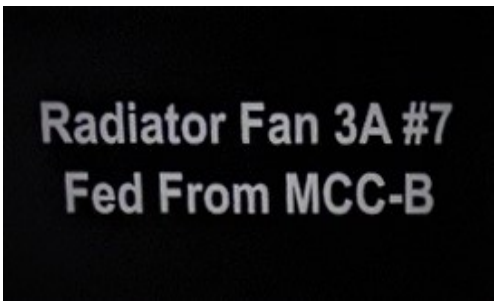
MACON BUILDING
662 Highland Drive
Altamonte Springs, FL 32701
407.339.1188

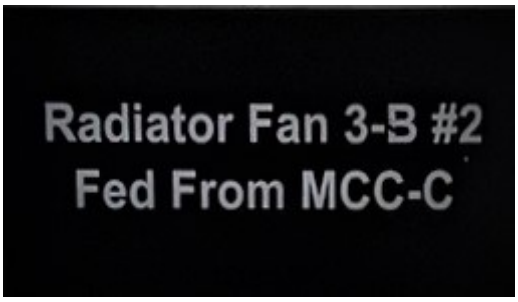
Project Name:	Verizon Generator Radiators Replacement Temple Terrace Center
Project Address:	7701 East Telecom Parkway, Temple Terrace, FL 33673
Project #:	1260003
Subject:	**Signage Submittal**
Radiator:	#3

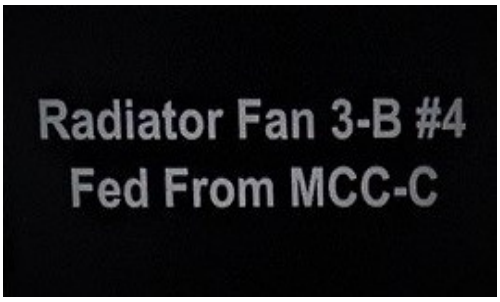


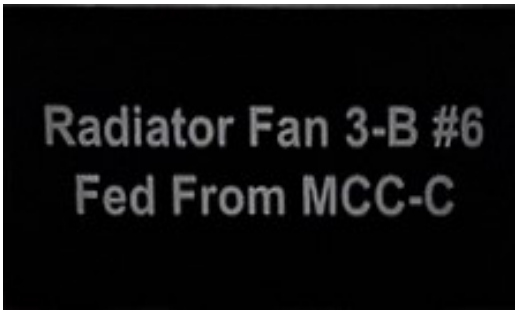


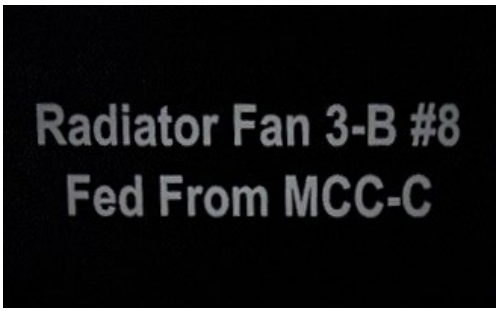












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4 Radiator # 2 x1

4 Radiator # 3 x1

24 Rowmark - Black Background White Text

Fiberfrax® Blanket and Mat Products

Introduction

The Fiberfrax® blanket and mat product family is a group of lightweight, thermally efficient ceramic fiber insulating materials that combine the advantages of dimensional stability at high temperatures with complete resistance to thermal shock. Featuring a broad range of thermal capabilities and physical characteristics, this product family provides proven and effective solutions to a variety of heat processing applications.

Durablanket® ceramic fiber products are high strength, needled insulating blankets that are made from spun Fiberfrax ceramic fibers. The extra-long spun fibers, cross-locked through a unique forming process, produce a blanket with exceptional handling strength. The Durablanket product family is completely inorganic and available in a variety of temperature grades, densities, and sizes.

Fibermat® Mat, PH blanket, and Moist Pak-D® insulation provide additional options for specific application requirements ranging from high-temperature filtration to hot gas velocity resistance.

Fibermax® Mat is a high-temperature, flexible mat product entirely composed of Fibermax polycrystalline mullite fibers, making it an extremely lightweight, highly resilient insulator that is virtually free of unfiberized ("shot") particles.

Having excellent chemical stability, Fiberfrax blanket and mat products are unaffected by most chemicals except hydrofluoric and phosphoric acids and concentrated alkalies. If wet by water or steam, thermal and physical properties remain unaffected after drying.

Durablanket® S

Fiberfrax Durablanket S insulation is a strong, lightweight, flexible needled blanket that is made from spun ceramic fibers. Available in a wide variety of thicknesses, widths and densities, Durablanket S insulation provides an array of proven solutions for a broad spectrum of application problems.

Durablanket® HP-S

Fiberfrax Durablanket HP-S insulation is a needled blanket made from spun Fiberfrax ceramic fibers. Durablanket HP-S insulation combines all of the physical characteristics offered by Durablanket S insulation in a product with a high-purity chemistry. The chemistry of Durablanket HP-S provides improved performance and service life in applications where fluxing or chemical attack occurs.

Durablanket® 2600

Fiberfrax Durablanket 2600 insulation extends the high-temperature performance of the Durablanket product line. The product is made from high-purity alumina, zirconia, and silica spun ceramic fibers. This chemical composition, manufactured in a unique fiber-making process, imparts Durablanket 2600 insulation with extremely low shrinkage characteristics at elevated temperatures.

Refer to the product Material Safety Data Sheet (MSDS) for recommended work practices and other product safety information.

Duraback®
Fiberfrax Duraback blanket is a strong, lightweight, flexible needled blanket intended for use as a cost-effective back-up insulation in Fiberwall® furnace linings. It is recommended for use up to 982°C (1800°F).

Duraback blanket can be installed up to four times faster than common block-type back-up insulation.

Fibermat® Blanket
Fiberfrax Fibermat is a lightweight, high-strength needled insulating blanket. The blanket fibers are spun from a ceramic composition having a normal use limit of 760°C (1400°F). Fibermat is completely inorganic and derives its exceptional strength from the needling of long ceramic fibers.

It has excellent thermal and acoustical insulating properties.

PH Blanket
Fiberfrax PH blanket is a unique product that has been specifically designed to provide excellent filtration capabilities in addition to the high chemical stability and low thermal conductivity that is possessed by all Fiberfrax products.

PH blanket is made from Fiberfrax bulk ceramic fibers in a unique wet felting process which removes unfiberized particles. In addition to the strength and resiliency afforded by the interlocking of fibers during the manufacturing process, handling strength is further enhanced by the addition of a small amount of organic binder.

A typical filtration application would involve utilizing PH blanket as a platinum catalyst recovery filter in nitric acid production. In this application, PH blanket offers numerous advantages over glass wool products including longer life, 50-60% improved filter efficiency, reduced chance of blowouts, and better temperature resistance.

Moist Pak-D®
Fiberfrax Moist Pak-D insulation is made from high-strength ceramic fiber blankets impregnated with inorganic bonding agents. This processing results in a flexible insulation that air dries to form a hard, rigid structure. Moist Pak-D is ideal for insulation of complex shapes and for service under conditions of high hot gas velocities.

The material is packaged in a clear polyethylene bag to retain the wet binder during shipment and storage. Since damage will occur, care should be taken to prevent freezing of the product.

Curing of product can be accomplished by air drying for several days or by immediate exposure to temperature in the application. Curing is merely a function of removing the water from the inorganic binder.

Fibermax® Mat
Fibermax Mat is a high-temperature, flexible mat product that is lightweight (1.5 lb/ft^3 density) and highly resilient. It is composed entirely of Fibermax polycrystalline mullite fibers to produce a product that is high-temperature (1650°C/3000°F) resistant and virtually shot-free.

Fibermax Mat contains no organic binders or other additives which cause outgassing fumes or associated problems. In addition to exhibiting excellent resistance to attack from most corrosive agents (exceptions include hydrofluoric acid, phosphoric acid and strong alkalies), Fibermax fiber also resists oxidation and reduction.

Product Family Characteristics

- Excellent handling strength
- Excellent hot strength
- Low thermal conductivity
- Low heat storage
- Light weight
- Resiliency
- Thermal shock resistance
- High heat reflectance
- Excellent corrosion resistance
- Excellent thermal stability
- Excellent sound absorption
- Excellent fire protection

Specific Product Characteristics

- Extremely low shrinkage: Fibermax Mat
- Low shrinkage: Durablanket 2600 insulation
- Exceptional handling strength: Durablanket 2600 insulation, Durablanket S insulation, Durablanket HP-S insulation, Fibermat Blanket
- Exceptional hot strength: Durablanket 2600 insulation
- Exceptional velocity resistance: Moist Pak-D insulation
- Excellent conformance to complex shapes: Moist Pak-D insulation
- Low shot content (95% fiber index): Fibermax Mat
- Exceptional sound absorption: Fibermat Blanket, PH blanket
- High resiliency: Fibermax Mat
- Excellent compression recovery: Fibermat Blanket
- Excellent filtration capabilities: PH blanket

Typical Applications

Durablanket® S and Durablanket® HP-S

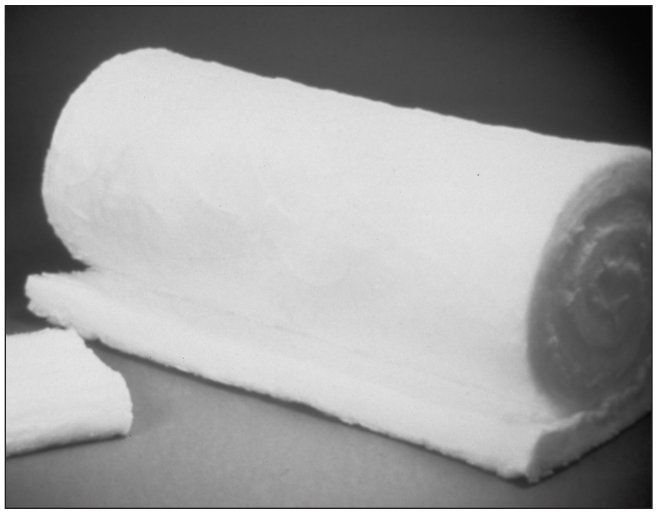
- Furnace, kiln, reformer and boiler linings
- Investment casting mold wrappings
- Removable insulating blankets for stress relieving welds
- Reusable insulation for steam and gas turbines
- Flexible high-temperature pipe insulation
- Pressure and cryogenic vessel fire protection
- High-temperature kiln and furnace insulation
- Furnace door linings and seals
- Soaking pit seals
- Furnace repairs
- Thermal reactor insulation
- Expansion joint seals
- Primary reformer header insulation
- High-temperature gasketing
- Glass furnace crown insulation
- Incineration equipment and stack linings
- Annealing cover seals
- High-temperature filtration
- Nuclear insulation applications
- Atmosphere furnace lining
- Field steam generator lining

Durablanket® 2600
- Ceramic kilns (abrasives, sanitary ware, electrical insulators, etc.)
- Billet/slab reheat furnaces
- Seals, gaskets, batten strips
- Forge furnaces
- Refractory kilns
- BOF door/shields
- Soaking pit seals
- High-temperature kilns and furnaces
- Boiler linings
- Furnace door linings and seals
- Glass furnace crown insulation
- Incineration equipment
- Skid pipe insulation

Duraback®
- Back-up for Fiberwall® lining systems
- Filler for insulating pads
- Expansion joint material

Fibermat® Blanket
- Acoustical insulation
- Thermal insulation for external applications
- Insulating pads

PH Blanket
- Catalyst recovery filter in nitric acid production
- Diffusion medium for fluidized beds
- Filtration and catalyst carrier medium for radioactive particles and hot exhaust gases



Fiberfrax blanket

Moist Pak-D®
- Hot face layer for Fiberfrax heater, furnace and kiln linings where hot gas velocities exceed 12.2 m/sec (40 ft/sec)
- Hot gas duct, flue and stack linings
- Recuperator linings
- Blow pipe linings
- External and internal pipe insulation
- Reformer header insulation
- Process furnace tube weld protection
- Thermal and corrosion protection of process heater tube supports

Fibermax® Mat
- Expansion joint packing
- Burner wraps
- Batten strips with fiber modules
- Aluminum homogenizing furnace linings

Typical Product Properties

	Duraback	Durablanket S	Durablanket HP-S	Durablanket 2600
Color	White	White	White	White
Temperature Grade*	982°C (1800°F)	1260°C (2300°F)	1316°C (2400°F)	1430°C (2600°F)
Recommended Operating Temperature	1800°F	2150°F	2200°F	2450°F
Melting Point	1648°C (3000°F)	1760°C (3200°F)	1760°C (3200°F)	1760°C (3200°F)
Fiber Diameter	2-4 microns (mean)	2.5-3.5 microns (mean)	2.5-3.5 microns (mean)	3.5 microns (average)
Specific Heat @ 1093°C (2000°F)	1130 J/kg °C (0.27 Btu/lb °F)	1130 J/kg °C (0.27 Btu/lb °F)	1130 J/kg °C (0.27 Btu/lb °F)	1130 J/kg °C (0.27 Btu/lb °F)
Specific Gravity	2.73 g/cm^3	2.73 g/cm^3	2.73 g/cm^3	2.73 g/cm^3
Average Tensile Strength	—	4 lb/in^2 min. @ 4 PCF 6 lb/in^2 min. @ 6 PCF 7 lb/in^2 min. @ 8 PCF	—	—

	PH Blanket	Moist Pak-D
Color	Tan	White
Temperature Grade*	1260°C (2300°F)	1093°C (2000°F)
Recommended Operating Temperature	2150°F	1850°F
Melting Point	1790°C (3260°F)	1790°C (3260°F)
Fiber Diameter	4-8 microns (mean)	2-3 microns (mean)
Specific Heat Capacity @ 1093°C (2000°F)	—	1130 J/kg °C (0.27 Btu/lb °F)
Tensile Strength – 6.4 mm (¼"): (ASTM 686-76)	—	Wet = 1.2 x 10^5 N/m^2 (17 psi) Dry = 3.5 x 10^5 N/m^2 (50 psi)
Hot Gas Erosion Resistance:	N/A	Test procedure based on British Gas Council Research Comm. GC173 = over 30.5 m/sec (100 ft/sec)

	Fibermat Blanket	Fibermax Mat
Color	White	White
Temperature Grade*	760°C (1400°F)	1650°C (3000°F)
Recommended Operating Temperature	1250°F	2850°F
Melting Point:	—	1870°C (3400°F)
Fiber Diameter	2.5-3.5 microns (mean)	2-3.5 microns (mean)
Specific Gravity:	2.73 g/cm^3	3 g/cm^3
Tensile Strength (ASTM 686-76):	7-10 psi (typical)	—
Specific Heat Capacity at 1093°C (2000°F):	—	1246 J/kg °C (0.297 Btu/lb °F)
Fiber Surface Area:	—	7.65 m^2/g

*The temperature grade of Fiberfrax insulation is determined by irreversible linear change criteria, not product melting point.

Test data shown are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Typical Product Parameters

	Duraback	Durablanket S	Durablanket HP-S	Durablanket 2600
Available Density				
kg/m^3	64	64, 96, 128	64, 96, 128	96, 128
(lb/ft^3)	(4)	(4, 6, 8)	(4, 6, 8)	(6, 8)
Chemical Composition				
Al_2O_3	31-35%	43-47%	43-47%	29-31%
SiO_2	50-54%	53-57%	53-57%	53-55%
ZrO_2	5%	—	—	15-17%
Fe_2O_3	1.3%	Trace	—	—
TiO_2	1.7%	Trace	—	—
MgO	*0.5%	—	—	—
CaO	≤7.5%	—	—	—
Na_2O_3	—	<.5%	<.5%	—
Alkali	—	0.05%	—	—
Leachable Chlorides	—	<10 ppm	<10 ppm	<10 ppm
Other Inorganics	—	0.85%	—	—

*MgO and other trace inorganics

	PH Blanket	Moist Pak-D*	Fibermat Blanket	Fibermax Mat
Available Density		(Typical Dry)		
kg/m^3	96	190-290	88	24
(lb/ft^3)	(6)	(12-18)	(5.5)	(1.5)
Binder Content	3-5%	—	—	—
Chemical Composition				
Al_2O_3	43-47%	23-32%	29-47%	72%
SiO_2	53-55%	68-77%	52-57%	27%
ZrO_2	—	—	<18%	—
Fe_2O_3	Trace	—	—	0.02%
TiO_2	Trace	—	—	0.001%
MgO	—	—	—	0.05%
CaO	—	—	—	0.05%
Na_2O_3	<.5%	<.5%	<.5%	0.10%
Alkali	—	—	—	—
Leachable Chlorides	<10 ppm	—	<10 ppm	11 ppm
Other Inorganics	—	—	—	—
Nominal Weight	—	—	½" thickness = 3.7 oz/ft^2 1" thickness = 7.3 oz/ft^2 2" thickness = 14.7 oz/ft^2	—

*Normal shelf life one year in unopened containers.

For additional information about product performance or to identify the recommended product for your application, please contact the Unifrax Application Engineering Group at 716-768-6460.

Typical Durablanket Heatflow Calculations

		Lining Cross-Section			
		1" Durablanket S, 8PCF 1½" Durablanket S, 6PCF 1½" Duraback, 4PCF	2" Durablanket S, 8PCF 2" Durablanket S, 6PCF 2" Duraback, 4PCF	2" Durablanket S, 8PCF 2" Durablanket S, 6PCF 4" Duraback, 4PCF	2" Durablanket S, 8PCF 2" Durablanket S, 6PCF 6" Duraback, 4PCF
Hot Face °C (°F)	**Insulation Thickness – mm (in) Cold Face Temperature –**	**102 (4) °C (°F)**	**152 (6) °C (°F)**	**203 (8) °C (°F)**	**254 (10) °C (°F)**
649 (1200)		80 (176)	65 (149)	57 (135)	53 (127)
871 (1600)		115 (238)	91 (196)	80 (175)	72 (161)
1093 (2000)		158 (317)	125 (257)	109 (228)	98 (205)

		Lining Cross-Section			
		2" Durablanket 2600, 8PCF 2" Durablanket S, 6PCF 2" Duraback, 4PCF	2" Durablanket 2600, 8PCF 4" Durablanket S, 6PCF 2" Duraback, 4PCF	2" Durablanket 2600, 8PCF 4" Durablanket S, 6PCF 4" Duraback, 4PCF	2" Durablanket 2600, 8PCF 4" Durablanket S, 6PCF 6" Duraback, 4PCF
Hot Face °C (°F)	**Insulation Thickness – mm (in) Cold Face Temperature –**	**152 (6) °C (°F)**	**203 (8) °C (°F)**	**254 (10) °C (°F)**	**305 (12) °C (°F)**
1149 (2100)		134 (274)	114 (238)	103 (218)	94 (202)
1260 (2300)		154 (310)	132 (269)	118 (245)	109 (228)
1316 (2400)		165 (329)	141 (285)	127 (260)	116 (241)

All heat flow calculations are based on a surface emissivity factor of .90, an ambient temperature of 27°C (80°F) and zero wind velocity, unless otherwise stated.

All thermal conductivity values for Fiberfrax materials have been measured in accordance with ASTM Test Procedure C-177. When comparing similar data, it is advisable to check the validity of all thermal conductivity values and ensure the resulting heat flow calculations are based on the same condition factors. Variations in any of these factors will result in significant differences in the calculated data.

For additional information about product performance, to identify the recommended product for your application, or for a specific heatflow calculation, please contact the Unifrax Application Engineering Group at 716-768-6460.

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

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