

## SAFFIL

### Fiber, Blanket, Mat and Felt Products

#### Introduction

Saffil® Alumina Fibers are high-purity polycrystalline fibers designed for use in applications up to 1600°C. Since their development in the early 1970s, Saffil Fibers have been used successfully to solve problems in demanding high-temperature insulation and many other specialty applications.

Saffil Fibers are produced by a unique solution extrusion process which ensures the highest levels of chemical purity and lowest possible levels of shot content (non-fibrous particles).

The unique method of manufacture allows the fiber diameter to be strictly controlled with a median of approximately 3 microns with very low levels of fiber less than 1 micron in diameter.

#### Health and Safety

Saffil Fibers were designed with the expert advice of toxicologists to minimize the potential for biological activity.

The fibers are produced in a novel spinning process from a viscous aqueous solution to give a narrow diameter distribution. They are all then subjected to a controlled heat treatment to develop a polycrystalline microstructure.

#### LA, HA and HX Fibers

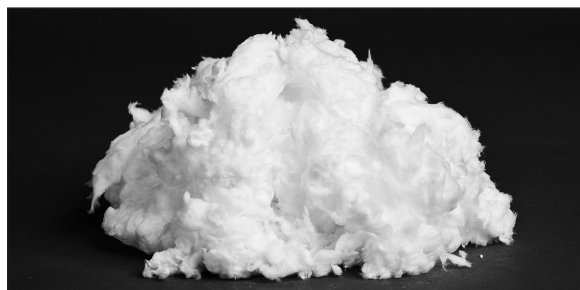
##### Introduction

LA & HA Fibers are processed to give the finished product exceptional resistance to shrinkage and chemical attack at high temperature, while maintaining excellent resilience characteristics.

HX Fiber is processed to ensure that a high level of Alumina is converted into the extremely thermally stable alpha Alumina phase. This fiber is the most chemically resistant in the Saffil family of products.



LA & HA Fibers



HX Fiber



Saffil Blanket and Mat

#### Refractoriness

Low shrinkage at high temperature (1600°C) ensures long life in the most demanding applications.

#### Thermal Conductivity

Very low shot levels translate into low thermal conductivity, offering savings on fuel and rapid payback on investment.

### Resistance to Chemical Attack

The high levels of alumina, low silica and trace element levels ensure chemical stability in the majority of industrial process conditions.

### Resilience

Unique method of manufacture and high classification temperature result in a fiber with exceptional resilience at high temperature.

### Vacuum Forming

Blended products manufactured using Saffil bulk fiber and proprietary binder systems give exceptional, cost-effective performance.

### Typical Applications

Saffil Fibers are used to increase the maximum use temperature in module, board, vacuum formed shape and paper manufacture. The fiber can be further treated by milling for more specialist applications.

## LA, HA and HX Grade Bulk – Technical Data

	LA Bulk	HA Bulk	HX Bulk
Classification Temperature	1600°C	1600°C	1600°C
Color	White	White	White
Solubility in water	Insoluble	Insoluble	Insoluble
Median Fiber Diameter	3.0-4.0 (Micron)	3.0-4.0 (Micron)	3.0-4.0 (Micron)
Density	3.3-3.5 g/cm <sup>3</sup>	3.3-3.5 g/cm <sup>3</sup>	3.3-3.5 g/cm <sup>3</sup>
Shot Content (Non-Fibrous Material)	Negligible	Negligible	Negligible
Melting Point	>2000°C	>2000°C	>2000°C
Shrinkage (6 Hours at 1500°C)	<4 %	<2 %	<1 %
LOI (2 Hours at 800°C)	0 %	0 %	0 %

### Chemical Composition

Aluminum Oxide	95-97 %	95-97 %	95-97 %
Silica	3-5 %	3-5 %	3-5 %
Trace Elements	<0.5 %	<0.5 %	<0.5 %

### Availability and Packaging

5kg Bale – Packed in plastic bags

## Saffil Blanket and Mat

Saffil Blankets are high temperature, lightweight, needled blankets manufactured from high purity, polycrystalline fiber with a polypropylene carrier to optimize strength and flexibility.

### Refractoriness

Low shrinkage at high temperature (1600°C) ensures long life in the most demanding applications. High fuel and maintenance cost savings can be made. Stability of the material at high temperature removes the problem of lining degradation over time, which can result in premature lining failure or costly contamination of product.

### Thermal Conductivity

Very low shot levels translate into low thermal conductivity – almost half that of other types of insulating fiber per kilogram. Significant fuel savings are possible, resulting in rapid payback on investment. Substantially thinner linings offer the designer increased capacity within existing furnaces or opportunities for savings in new furnace projects.

### Resistance to Chemical Attack

The high levels of Alumina, low Silica and trace element levels ensure chemical stability in the majority of industrial process conditions.

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## Resilience

Control of the crystalline microstructure during manufacture and high classification temperature result in a highly resilient fiber even when exposed to elevated temperatures. Additionally, since the expansion occurs in the product after firing, this property contributes to reducing gaps in modular linings and ensuring long maintenance-free life.

## Thermal Shock Resistance

The low heat storage and fibrous structure reduce the problems normally caused by thermal shock. Faster cycle times are possible, offering advantages in the form of reduced fuel consumption and increased capacity.

## Typical Applications

Saffil Blanket is used to form stack bonded and convoluted modules for use in the lining of kilns, furnaces and heaters in all industry sectors. The modules are supplied in the form of mechanically fixed or veneering modules. Saffil Blanket is extremely resilient and flexible which makes it an ideal material for expansion gap filling, seals and as a lining in the construction of industrial furnaces and kilns.

Saffil Mat is widely used to form stack bonded modules, as expansion gap filling, high-temperature seals and as a lining in the construction of industrial furnaces and kilns. Additionally, specialist applications in filtration, automotive, soundproofing and catalyst support have been commercialized.

## Blanket and Mat – Technical Data

	Blanket	Mat
Classification Temperature	1600°C	1600°C
Color	White	White
Solubility in water	Insoluble	Insoluble
Fiber Diameter (Median)	3.0-3.5 (Micron)	3.0-3.5 (Micron)
Shot Content (Non-Fibrous Material)	Negligible	Negligible
Melting Point	>2000°C	>2000°C
Shrinkage (6 Hours at 1500°C)	<4 %	<4 %
LOI (2 Hours at 800°C, Fiber only)	0 %	0 %

## Chemical Composition

Aluminum Oxide	95-97 %	95-97 %
Silica	3-5 %	3-5 %
Trace Elements	<0.5 %	<0.5 %
Polypropylene scrim added by weight*	<5 %	0 %

\*When firing the blanket for the first time, a small amount of organic burnout will occur.  
For more information, consult the Unifrax Application Engineering Group at 716-768-6460.

## Standard Availability

	Density (kg/m <sup>3</sup> )	Length (mm)	Width (mm)	Thickness (mm)
Mat Rolls	35	14800	610	35
Blanket Rolls	96	14600	610	13
Blanket Rolls	96	7300	610	25

## Availability and Packaging

Blanket is supplied in rolls packed in cardboard cartons (570 x 570 x 670mm)

Mat is rolled onto paper and packed in cardboard boxes

Note: Product dimensions provided are nominal

Saffil Mat is a high-temperature, lightweight, un-needled product manufactured from high purity polycrystalline fiber designed for use up to 1600°C. Saffil Mat is completely inorganic.

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## Saffil® Felt

### Introduction

Saffil® Felt is lightweight, intumescent and dust free. It is supplied as a flexible sheet, which is easily cut to shape. The fibers are held in compression by an acrylic polymer binder which burns out completely at temperatures in excess of about 400°C, and an expansion in its thickness occurs.

### Benefits

#### Expansion

The highly resilient and flexible Saffil Fibers show exceptional recovery after exposure to heat expanding up to 3x the original thickness after removal of the binder.

#### Resilience

Control of the crystalline microstructure during manufacture and high classification temperature result in a highly resilient fiber even when exposed to elevated temperatures.

#### Refractoriness

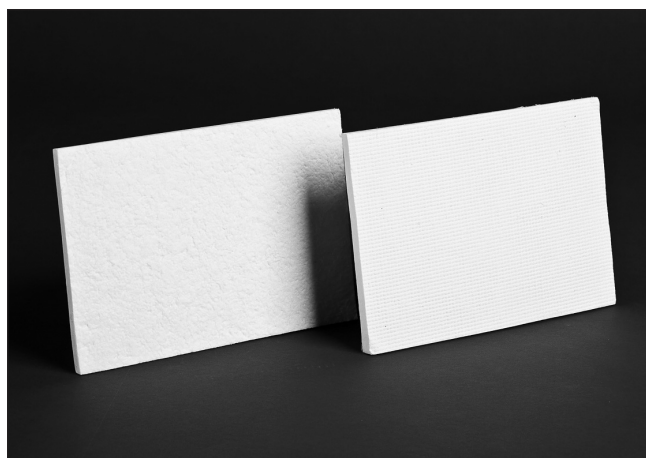
Low shrinkage at high temperature (1600°C) ensures long life in the most demanding applications.

#### Resistance to Chemical Attack

The high levels of Alumina and low levels of Silica and trace element levels ensure chemical stability in the majority of industrial process conditions.

#### Typical Applications

Saffil Felt is widely used as an expansion gap filling in the construction of industrial furnaces, kilns and in the manufacture of high-temperature seals and gaskets. It can also be used in the installation of new refractory linings to overcome the effects of shrinkage in fiber linings and to accommodate expansion in dense refractory installations.



Saffil Felt

### Summary of Typical Felt Properties

Saffil Fiber	88 – 93%
Organic binder	7 – 12%
Basis weight	1300gsm +/-10%
Thickness	6-10mm
Expansion	3x
Sheet Size	700mm x 550mm

#### Standard Availability

Standard dimensions of sheet is 700mm x 550mm

#### Standard Packaging

Cardboard boxes to match sheet size  
Standard quantity of sheets per box is 20

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.

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes. Refer to the product Safety Data Sheet (SDS) for recommended work practices and other product safety information.

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