

## Foamfrax® Insulation

Foamfrax® Insulation is a monolithic insulation system developed by Unifrax. Foamfrax Insulation is a three-component system of specially conditioned bulk ceramic or soluble fibers, an inorganic binder, and an organic foaming binder.

The Foamfrax installation process combines the bulk fiber material with the inorganic and organic binders in a patented mixing mechanism. Within the mixing chamber, the fibers and binders are combined to create a homogeneous foam/fiber mixture. The Foamfrax installation machinery propels this mixture through a feed hose and nozzle, and the material is then gunned onto the target surface. The proprietary Foamfrax binder system and patented installation method completely encapsulate the fibers with the foaming binder, significantly reducing airborne fiber levels during installation. Foamfrax Insulation is available in the following fiber grades: Foamfrax Grade I Fiber (2300°F Refractory Ceramic Fiber), Foamfrax Grade II Fiber (2600°F Refractory Ceramic Fiber), Foamfrax Grade III (3000°F Polycrystalline Mullite Fiber) and Isofoam™ Fiber (2300°F Soluble Fiber).

Foamfrax Insulation is easily installed at the job site by trained contractors using the special Foamfrax installation machinery. The interlocking network of fibers provides a strong, uniform monolithic structure having excellent thermal insulating properties, very low heat storage, and excellent resistance to thermal shock. Foamfrax Insulation is unaffected by most chemicals except hydrofluoric acid, phosphoric acid, and concentrated alkalis.

Foamfrax Insulation is used to insulate metal, refractory, or ceramic fiber surfaces at temperatures up to 2800°F. It can be installed at rates in excess of 1000 board feet/hour and is used in a wide range of furnace lining and other insulating applications. A principal application of Foamfrax Insulation is to upgrade the efficiency of partially deteriorated furnace linings. The rapid application of several inches of Foamfrax Insulation onto the existing hot face surface extends the furnace lining life and improves furnace efficiency. Foamfrax Insulation can also be installed as a full-thickness system by using stainless steel anchors which are embedded within the Foamfrax Insulation to retain the furnace lining.

Foamfrax Insulation has the following outstanding characteristics:

- Speed and ease of installation
- Low rebound during installation
- Low thermal conductivity
- Low thermal shrinkage
- Low heat storage
- Excellent thermal shock resistance
- Good chemical resistance
- Good sound absorption



Foamfrax Installation

### Principal Applications

- Furnace linings (reformers, boilers, kilns, heat treating furnaces, etc.)
- Vessel Linings
  - Incinerators, Flues, Ducts and Stacks
- Furnace refractory upgrades
  - Lining over Refractory (LOR)
  - Fiber over Fiber (FOF)
- Low mass kiln car decks
- Ladle preheat stands
- Backup for high-density gunned refractories
- Boiler tube wall insulation
- Furnace lining maintenance (gunning gaps, cracks and voids)
- Fire protection



Foamfrax Equipment

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

The Foamfrax Technology is protected under the following U.S. Patents: 4,978,252, 5,131,590 and 4,768,710.

## Typical Product Properties

	Foamfrax Grade I Fiber	Foamfrax Grade II Fiber	Foamfrax Grade III Fiber	Isofoam Fiber
Color (Fired)	White	White	White	Bluish-White
Melting Point	3200° F (1760° C)	3200° F (1760° C)	3200° F (1760° C)	2730° F (1500° C)
Temperature Grade	2300° F (1260° C)	2600° F (1430° C)	3000° F (1649° C)	2300° F (1260° C)
Recommended Operating Temperature <sup>(1)</sup>	2150° F (1175° C)	2450° F (1345° C)	2800° F (1538° C)	2300° F (1260° C)
Installed Wet Density	16 pcf (256 kg/m <sup>3</sup> )	16 pcf (256 kg/m <sup>3</sup> )	16 pcf (256 kg/m <sup>3</sup> )	16 pcf (256 kg/m <sup>3</sup> )
Installed Fired Density	8 pcf (128 kg/m <sup>3</sup> )	8 pcf (128 kg/m <sup>3</sup> )	8 pcf (128 kg/m <sup>3</sup> )	8 pcf (128 kg/m <sup>3</sup> )
Loss On Ignition (LOI)	.75%	.75%	.75%	.75%
Moisture (At Installation)	50%	50%	50%	50%
Shrinkage (24 hrs. @ Operating Temperature)	<3%	<3%	<3%	<3%

(1) The recommended operating temperature of Fiberfrax Products is determined by irreversible linear change criteria, not melting point.

## Typical Product Parameters

### Chemical Composition

	Foamfrax Grade I Fiber	Foamfrax Grade II Fiber	Foamfrax Grade III Fiber	Isofoam Fiber
MgO				19-26%
Al <sub>2</sub> O <sub>3</sub>	47-52%	29-31%	59-63%	
SiO <sub>2</sub>	48-53%	53-55%	36-40%	72-77%
ZrO <sub>2</sub>		15-17%		
Na <sub>2</sub> O	<.5%			
Trace Elements			<2%	0-4%
Average Fiber Diameter (microns)	1.5-2.5	1-2	1-3.5	1.8-2.8

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

For additional information about product performance or to identify the recommended product for your application, please contact the Unifrax Application Engineering Group at 716-278-3888.

