

## Common Questions About Foamfrax® Insulation Applications

### 1. Does Foamfrax® stick to hard refractories? Ceramic fiber?

Yes. Foamfrax works very well when applied to both types of surfaces, provided the substrate is properly prepared. Dust, sand, or any loose material must first be removed from the substrate. Prior to the application, a dilute Fiberstick™ Cement (refractory mortar) must be applied to the surface. While the Fiberstick Cement is wet, the Foamfrax is applied. If the Fiberstick Cement dries, the substrate must be treated again prior to the Foamfrax application.

### 2. Have you experienced any failures?

Failures of Foamfrax have occurred in a few cases. Some initial applications of Foamfrax did not use a Fiberstick Cement surface prep for veneers. As a result, some of the material did not adhere properly. However, since the application of Fiberstick Cement surface prep has been utilized, there have been excellent results with installations over fiber or hard refractory surfaces.

**Note:** Not all substrates are capable of lining upgrades using Foamfrax Insulation. Extremely smooth surfaces or surfaces in poor condition (loose and falling out) may not allow a strong enough bond between the substrate and the Foamfrax insulation.

### 3. Who can apply Foamfrax Insulation?

A Foamfrax machine is required to apply the material. The Foamfrax machine, binders, and the technology are proprietary and are covered under numerous patents. Unifrax can provide contact information for qualified installers in respective geographic areas.

### 4. Can Foamfrax be stored for small repair jobs?

No. The foaming binder matrix that allows Foamfrax to be applied so easily dissipates shortly after Foamfrax leaves the mixing chamber and workability of the product is reduced. For small patch jobs, Unifrax has a number of pre-mixed products that have extended shelf life. These products can be applied by hand troweling, or gunned placement.

### 5. What is the gas velocity ablation resistance of Foamfrax Insulation?

Foamfrax Grade I, Grade II, and Grade III are recommended for applications with velocities up to 40 feet per second with a laminar gas flow. Foamfrax RG is recommended for applications with velocities up to 150 feet per second. Please contact your Unifrax Sales Engineer or the Application Engineering Group regarding the effect of coatings or Rigidizer™ for improved gas velocity resistance.

### 6. Can different anchors be used in a full thickness Foamfrax lining?

Unifrax has engineered the full thickness lining system to insure extended service life. Details of the design guidelines can be found in the *Foamfrax Insulation Installation Guide*. However, our distribution network is comprised of seasoned installers/contractors that can make recommendations using different anchors based on their expertise. Alternative anchoring methods should be reviewed and approved by Unifrax application engineering prior to Foamfrax installation.

### 7. Can Foamfrax Insulation materials be installed as a composite system?

Yes. This technique maximizes the thermal stability of the Foamfrax lining while reducing the overall cost of the installation. A composite Foamfrax lining can be installed which places different grades of Foamfrax material throughout the lining cross-section. Foamfrax can also be used to upgrade an existing lining so the furnace can function at a higher operating temperature.

### 8. What is Foamfrax RG Insulation?

Foamfrax RG and RG Plus Grade combines ceramic fiber, the Foamfrax binder, and a refractory cement additive to yield a finished density of 20 pcf-25 pcf. Foamfrax RG is a refractory grade ceramic fiber based material designed to provide backup insulation for castable, plastics, or hard refractory brick. Foamfrax RG has a continuous use limit of 1800°F and is air dried. Foamfrax RG has thermal characteristics similar to ceramic fiber boards and a high MOR. It can be installed at rates of 800 board feet/hour. It also allows the installer to incorporate a low-density monolithic back-up material for overall lining efficiency yet still use a one-piece refractory anchoring system.

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**9. What is the curing time for a Foamfrax Lining?**

Foamfrax Grade I, II, and III Insulation can be fired immediately after installation and brought up to temperature without regard to a specific curing cycle. Foamfrax RG Grade should be air dried for 24 hours prior to firing.

**10. How close does the firing Foamfrax machine have to be to the point of installation?**

The standard Foamfrax machine set-up permits installation at a distance up to 120' from the machine to the work surface. However, additional hose may be added to increase this distance up to 300' or more. This flexibility in machine location/proximity to a job also applies to the vertical distance between the machine and point of installation.

**11. How much shrinkage occurs with Foamfrax Insulation?**

When installed in accordance with Unifrax's published guidelines, each Foamfrax insulation grade will exhibit 1-3% shrinkage at temperatures up to the recommended use temperature limit. The presence of fluxing agents may accelerate shrinkage of all ceramic fiber products. Contact your Unifrax Sales Engineer or the Application Engineering Group for details.

**12. What types of emissions are associated with the firing of a Foamfrax Lining?**

Unifrax analyzed furnace lining emissions through an independent test lab. Foamfrax Insulation is applied at a wet density of 16 pcf and dries to a finished density of approximately 8 pcf. The majority of emissions during firing are water vapor. The EPA Method for Toxic Organic Compounds TO-15 was used for the tests. The results from this testing have been reviewed by Unifrax's health, safety and environmental Quality Group, and found to be within all regulated standards for stack emissions. A copy of the actual lab report of this testing is available upon request.

**13. Is there any rebound from the installation of Foamfrax Insulation?**

Foamfrax Insulation is typically installed with less than 1% rebound.

**14. How do I know how much binder to order?**

Unifrax customer service adds the correct amount of both types of binder to each order. The binder quantities are based upon the quantity of Foamfrax Insulation ordered.

