PRODUCT DATA SHEET

Furnace Mineral Products Inc.

Refraxe™

Energy Enhancement Refractory Coating

DESCRIPTION

Refraxe™ is an energy enhancement coating system that is designed to increase the emissivity of refractory surfaces. By increasing the emissivity - *a material's ability to absorb and re radiate energy* - a refractory surface will offer enhanced energy efficiency.

Refraxe offers the ability to transform the substrate surface to absorb and re radiate heat energy, improving the thermal efficiency and performance of furnaces and kilns.
The coating system stabilizes the surface's emissivity throughout the temperature range and seals the furnace's firebox to reduce heat loss.

The sealing effect of the Refraxe coating system provides surface densification improving the refractory's resistance to high velocity gas erosion, dusting and chemical attack. Ultimately improving the service life of the refractory material.

Refraxe coating systems are water based, inorganic chemistries that offer temperature resistance up to 2800 °F. The coating system offers excellent penetration and adhesion to the refractory surface.

The superior emissivity properties of Refraxe coating system are based upon the use of our proprietary resin and custom pigment nano ceramic additive technology.
Refraxe has an emissivity value of approximately 0.93 to 0.95. The coating system has the ability to maintain this emissivity value across a wide temperature range.

BENEFITS

- Increases radiant efficiency
- Decreases furnace heat up time
- Eliminates irritant refractory dusting
- Increases refractory service life
- Improves thermal cycling resistance
- Reduces heat loss through refractory
- Improves temperature uniformity
- Improves surface resistance to erosion
- Low installation cost

Refraxe RGD - is an amorphous synthetic aqueous slurry coating for treating surfaces of fiber refractory to provide a degree of surface hardness and resistance to erosion.

Refraxe 100 - ceramic coating for ceramic fiber, modules and board. To be applied overtop of RefraX RGD

Refraxe 200 - ceramic coating for insulating firebrick

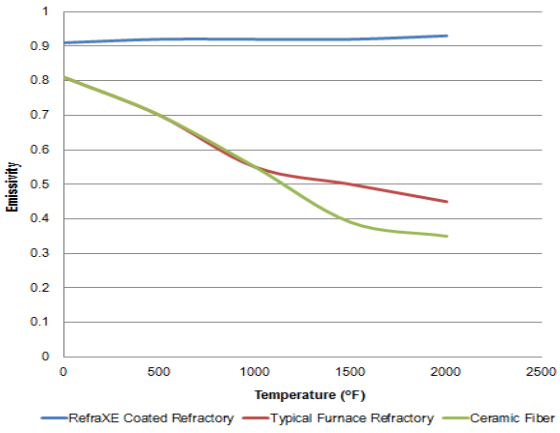
Refraxe 300 - ceramic coating for dense refractory brick

EMISSIVITY MECHANISM

Refractory wall to tube radiation is the dominant mode of heat transfer in a furnace firebox and emissivity plays an important role in determining the overall level of heat transfer efficiency.

When the combustion of natural gas occurs in a furnace firebox, the hot gases release energy that can be used either through convection or radiation. As the furnace temperature increases to "red hot", radiation becomes the dominant mode of heat transfer.

The nature of the radiation being emitted from the refractory surfaces is transformed to near Black Body radiation. This type of radiation is less easily re-absorbed by the flame and flue gases in the radiant section and can therefore penetrate more efficiently to the process tubes. The resulting effect is an increase in the usable heat flux from the refractory surface.



TECHNICAL PROPERTIES

Performance Property	Result
Max Temperature Rating	2800 °F
Emissivity Value (ASTM E408)	0.92 - 0.94
Viscosity, centipoises @ 77 °F (25 ° C)	500-800
pH	9.0 - 10.0
VOC Content	0 lbs per gallon
Carrier Solvent	Water
Solids Content	Approx 50 % by volume
Coverage Rate	Depends on surface condition consult with manufacturer
Recommended Thickness	Consult with manufacturer
Color	Flat Charcoal Black

MIXING INSTRUCTION

RefraXE is a single-component system. THIS PRODUCT CONTAINS HEAVY LOADING OF CERAMIC ADDITIVES. SETTLING IN THE PRODUCT IS COMMON. THE PRODUCT SHOULD BE MIXED FREQUENTLY DURING APPLICATION. Mix contents for 5 minutes until a uniform colour and consistency is achieved and the product is well dispersed. To ensure complete mixing, scrape sides and bottom of container and continue mixing for an additional 1 or 2 minutes. DO NOT HAND MIX. Begin application immediately – no induction time.
Frequently mix material during application. If spraying stops for more than 60 minutes, recirculate the material remaining in the spray line. Do not leave product in the hoses for long durations.

SURFACE PREPARATION

1) Ensure that surface is clean, dry and uncontaminated. Proceed only if the substrate temperature is more than 5°F above the dew point temperature during surface preparation and coating application. Refractory surfaces will vary in hardness, brittleness and dusting. It is important that proper precaution is used to prevent damage to the refractory during cleaning. In some cases soft brittle brush cleaning following by vacuuming may be the recommended method.
2) Pre wetting the surface with potable water may also be necessary based on the condition of the surface and environmental conditions. Consult with manufacturer

APPLICATION INSTRUCTIONS

Once mixed, the material must be screened with 60 to 80 mesh filter. The product may be applied by brush, airless or conventional spray. Teflon packings are recommended and available from the pump manufacturer. Prior to use, flush all equipment with clean potable water. Frequently mix material during application.

SAFETY

Before using any products, please refer to the Material Safety Data Sheet (MSDS).
Wear eye safety protection, chemical resistant gloves. Use NIOSH approved cartridge type respirator or fresh air

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